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ABSTRACT

The development of postgraduate studies and the establishment of the Ph.D. in Britain are discussed. Events leading to the introduction of the Ph.D. degree between 1917 and 1920 are traced, and Germany and America's influence on the acceptance of postgraduate education and research in Britain is addressed. An analysis of the highly developed college system peculiar to the ancient English universities is included to identify factors that delayed the introduction of the Ph.D. in Britain. Individual provincial universities are chronicled, together with Cambridge, London, Scotland, Wales, and Oxford (the first to institute the Ph.D.). In analyzing the political forces at work in the inception of the research degree, attention is directed to the vital role played by the Universities Bureau of the British Empire (predecessor of the Association of Commonwealth Universities) and the pressures exerted by government to persuade the universities to cooperate with each other in providing postgradute courses and degrees. It is concluded that the arrival of the Ph.D. at British universities symbolized the modern era of organized training in research that was conceived and nurtured in Germany and imported and commercialized by America. (SW)

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HOW THE PhD CAME TO BRITAIN

A century of struggle for postgraduate education

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by Renate Simpson

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PREFACE

To-day, 13 per cent of all students at British universities are graduates working for higher qualifications. In 1938, shortly before the second world war, only six per cent were studying at postgraduate level and, going back another twenty-five years — on the eve of the first world war — in any department of even the largest university, only a handful continued beyond the Bachelors degree.

In 1914 there was no University Grants Committee to encourage specific research developments; there were no government-sponsored research councils and very few state grants to support postgraduate study; nor was there anything like the profusion of higher degrees, diplomas and certificates to which the graduate student may aspire as an integral part of the university system to-day. The higher doctorates of DSc and DLitt had been called into existence during the previous half century, but it was not until 1917 that the first British university introduced the lower doctorate. Within three years the PhD had been established in almost all departments of all British universities and with practically identical regulations.

Why was it that the British universities, which had always so jealously guarded their autonomous position, acted in such seeming unison on this particular question? Why did they introduce a new higher degree at a time when there was obviously immense pressure on them to provide extra facilities for undergraduates — to cater for returning soldiers who had been forced to delay or break off their studies because of the war?

German universities had been awarding the PhD degree more than a century before and America had introduced it in the early 1860s. What factors assisted the development of postgraduate education in those countries when Britain seemed still to regard the chief function of her universities to be the education of young gentlemen?

Some years ago, when I was engaged in a brief study of the history of higher degrees in Britain,[1] it became evident that for a more profound understanding of their development it was essential to find answers to some of these questions. An attempt to do so soon revealed that the gaps in existing knowledge and the wider significance of the whole subject were such as to warrant a much deeper study which, finally, resulted in the preparation of this book.

The circumstances surrounding the introduction of the PhD have been more than elusive and the general university historian has tended to evade the subject,[1] therefore perhaps also underestimating its implications — which in fact reached far beyond the realm of postgraduate education as such.

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[1] See Rudd in association with Simpson (1975) Chapter 2.

A major reason for the paucity of information was the total loss of an important source, when the headquarters of the Universities Bureau of the British Empire (now the Association of Commonwealth Universities) were destroyed during an air raid on London in 1940. This organization had played a vital role in bringing together the universities during the period of the first world war, when the introduction of the PhD was under discussion. The destruction of its records therefore meant that evidence and data had to be sought in individual university archives and an attempt made to piece together the series of events and interactions between universities which finally led to their uniform action on the new research degree. University archives ranging, as they do, from the almost non-existent, through the box-room piled high with barely labelled brown paper parcels, to the professionally organized institution — the task of unearthing the relevant material from individual universities was likely to be a most laborious process and possibly not very fruitful. In the event, while it certainly became a time-consuming operation, it also proved to be most rewarding.

Moreover, I was fortunate to embark on the project at a time when the papers relating to the most important period were just becoming available at the Public Record Office (then still subject to the 50-year secrecy rule).

This facilitated a direct insight into the more immediate political and economic considerations which led not only to the introduction of the PhD but, almost simultaneously, to the establishment of the Committee of Vice-Chancellors and Principals, the University Grants Committee and the Department of Scientific and Industrial Research. Many threads thus combined to endow the period of university history during which the PhD was introduced with a peculiar interest and importance. At the same time, in pursuing these back to their origins, it has been necessary to unravel certain relevant elements in the nineteenth-century history of German and American as well as British universities.

In following through the development of postgraduate education in Britain it has not been possible, nor would it have been advisable, to give equal emphasis to all the universities involved. In fact, rather more attention has been devoted to Oxford because that university itself — as well as individual Oxford men, whether as academics or as public figures — have played an important role at every stage in this aspect of university history. Developments at other universities have been discussed in some detail whenever they appear to have been of particular relevance to the general progress towards the British PhD.

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[1] An interesting example of such an omission is Michael Sanderson's otherwise excellent survey of *The Universities and British Industry, 1850-1970* in which the development of postgraduate study as a training for research workers receives scant mention (Sanderson 1972).

Whilst a detailed account has been presented of the events which led up to the introduction of the PhD and an even fuller account of the three-year period immediately preceding its introduction, no attempt has been made to discuss its subsequent regulations or the contents of theses or the present-day value of the degree. This has been and is being done elsewhere and goes beyond the scope of this book.

In the course of this study, many people and institutions have contributed to smoothing my path, and helped me on the way. I wish most sincerely to thank them all.

I acknowledge particularly the help given by the Calouste Gulbenkian Foundation which funded the Unit for Research into Higher Education at the University of Essex, under whose auspices I began this work; similarly the Department of Sociology at the University of Essex, whose generous grant enabled me to travel to a number of the older universities to carry out the necessary research in their archives.

My grateful thanks also to the staffs of the archives, libraries and offices of the Universities of Cambridge, Edinburgh, Leeds, London, Manchester and Oxford for their assistance and interest in my searches, and to the authorities of these universities for granting me access to their papers and permission to publish my findings.

I apologize to my colleagues, friends and family who have had to bear with me in my problems and enthusiasms, and to those among them who were kind enough to wade through and criticize earlier and much longer versions of this book.

Finally my special thanks to Lord Ashby (Eric Ashby) for his interest and encouragement in my searches and for his critical and most helpful comments on my first draft, and to Dr Ernest Rudd of the University of Essex for his unstinting support throughout my work.

COLLEGES HOLD BACK THE UNIVERISTY IN BRITAIN — GERMANY AND AMERICA FORGE AHEAD

The university degree system of mediaeval times

During the second half of the twentieth century, the system of higher degrees has become extremely diversified and complex, but basically the terms 'doctor' and 'master' are still those most commonly used to signify such qualifications.

Originally, these titles bore a very different meaning, since in the early mediaeval university the Masters degree was the only qualification awarded. It indicated the satisfactory completion of the student's 'apprenticeship' in the *universitas* (guild) of teachers and was synonymous with the title of teacher or professor. As such, its formal conferment by the university's chancellor would depend on the recommendation of the existing Masters. It signified the entry of a new Master into the teaching fraternity, by equipping him with the license to teach and thereby admitting him to membership of the university.

In the universities based on the student-orientated system of Bologna as opposed to the master-orientated one of Paris, the term 'doctor' was used for this qualification. These mediaeval Masters and Doctors degrees were thus the *only* qualification conferred and cannot in any sense be regarded as *higher* degrees.

Gradually some of these Doctors and Masters of Arts[1] began to engage in further, more specialized studies, which led to the evolution of structured courses in theology, medicine and law. These 'superior' faculties were grafted onto what was now termed the 'inferior' faculty of arts and led to doctorates in theology, medicine or law. In a sense, these superior degrees could be likened to our professional doctorates of the present day, which largely depend on high level specialized courses rather than research. The twentieth-century research degree had no equivalent in the mediaeval university, just as there was then no recognized profession of research.

Meanwhile, as the courses in the arts faculty became more structured, so the bachelorship began to be introduced to mark the achievement of the first step (*gradus*) towards the mastership. But for a long time this remained a semi-official qualification of no great significance.

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[1] *Doctor in Artes* or *Magister Artium*, implying the mastery of the seven liberal arts which were considered to sum up the total fund of human knowledge: the *trivium*, embracing grammar, dialectic and rhetoric, and the *quadrivium*, comprising arithmetic, geometry, astronomy and music.

In earliest Oxford and Cambridge, based as they were on the Paris system, the Masters degree was also the only meaningful qualification. The Oxford bachelorship, which existed already during the thirteenth century, was usually obtained at around the age of eighteen and signified no more than what would today be regarded as a school-level qualification. However, with the development of public schools in the fifteenth and sixteenth centuries, the universities were able to shed some of their lower level work, the student would begin his university studies when he was older and the period of time he spent there was reduced.

In France and notably in Germany, a similar process eventually shifted the bachelorship into the schools, where the *Baccalauréat* and the *Abitur*, respectively, marked the end of a broad but extremely rigorous school education as well as the entrance qualification to university. In Britain the bachelorship was retained in the universities. With the general change in emphasis, however, the 4-year course for the Bachelor of Arts at Oxford and Cambridge rose to an academic level not far removed from the original (7-year) MA. By the sixteenth and certainly the beginning of the seventeenth century, the 7-year residence qualification for the MA had become obsolete and the exercises for it a mere ritual, soon to be abandoned altogether.

The MA in England had thus become a pure formality — a confirmation of the Bachelors degree. It was, however, still the only route to membership of the university, carrying with it certain privileges and voting rights. It also retained the essence of its former significance, by conferring the right to teach. In Scotland, where the Bachelor of Arts degree had never assumed much importance, the MA has remained until quite recently *the* first degree of all students in the arts faculty. At no stage in its development therefore can the pre-nineteenth-century Masters degree in Britain be regarded as equivalent to that which in the present day would be termed a 'higher' degree.

For a fuller understanding of the evolution of that modern higher degree in Britain, it is necessary to identify certain factors which considerably delayed its introduction here, as compared with some countries on the continent and also with America. In this connection it will be seen that the highly developed college system, so peculiar to the ancient English universities, has been of extraordinary significance.

College tutors oust the professoriate

Originally, a small number of colleges were endowed by wealthy well-wishers of the university, to accommodate the 'fellow' — the impecunious Master of Arts, studying for a superior degree. Undergraduate students lived in one of the large number of privately owned halls or inns (at Oxford) and 'hostles' (at Cambridge). At the beginning of the fourteenth century, Oxford had only three secular colleges as compared with approximately 300 halls.[1]

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[1] See Hamilton (1825) p. 414.

During the fifteenth and early sixteenth centuries, the position was reversed because of the drastic reduction in student numbers. Not only did the plague and the Wars of the Roses take their toll, but the rise of new universities on the continent diverted some potential students away from the English universities. Later, stringent religious restrictions ushered in by the reformation, reduced the student population of Oxford and Cambridge even further. Many owners of halls and inns became bankrupt. The colleges, whose endowments were unaffected by student numbers, bought up cheaply the properties of these desperate private landlords and by the beginning of the sixteenth century, the number of halls at Oxford had fallen to fifty-five, while that of colleges had risen to twelve.[1]

The colleges now also began to accept students of the lower faculty (undergraduates) and fee-paying students of the superior faculties. Supported by university legislation impeding the continuation of private residence, they soon absorbed the remaining students and reigned supreme at both universities.

The decline in student numbers during the sixteenth century — from several thousand to barely a hundred at each university — also affected methods of teaching. Up to that time, and particularly before the age of the printed book, the professorial lecture was the chief means of instruction. But with such a reduced number of students this became impractical and the more personal system of tutorial teaching, suited to small groups of students, began to evolve.

With the eclipse of halls and inns and the colleges' virtual monopoly in housing all students at all levels — the responsibility of tutor naturally fell upon the older residents of the colleges, the fellows. These men, whose main duty in fulfilment of the wishes of their benefactors had been to study for degrees in the superior faculties, were thus increasingly devoting themselves to teaching students of the lower faculty who now resided in their colleges. In time their new functions became so institutionalized that — even when their numbers rose once again — the role and status of the professors had suffered irreparable damage.

In the specific context of the climate for learning and research — the atmosphere and the physical conditions in which the process of expanding knowledge operates — this transformation was highly significant. Formerly, university professors had been held in great esteem and, alongside their teaching, occupied a position favourable to the pursuit of personal studies in the field of their choice. Now they no longer had any authority in the university or any organic connection with the students. Neither had they any effect on what students were being taught by their more immediate teachers inside the colleges. Indeed, influenced by the latter, students were in no way encouraged to attend professorial lectures.

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[1] Ibid.

Professors received a pitifully low remuneration, with little prospect that any efforts they might make in higher learning or research would lead to increased financial reward or status. True, there were always a few who — devoted to their subject, their studies and the university — laboured on regardless, but their numbers were too small for their creative and scientific work to affect the generally low regard into which the professoriate had fallen.

The tutor has no time or inclination for research

Meanwhile the tutor-fellows were now engaged in so much teaching that they had little time for any but essential studies. Since students were not permitted to seek tutorial instruction outside their college walls, the tutors between them had to cover the whole spectrum of academic studies. Indeed there have been times in college history when a single tutor has had to cope with instructing all its students in all subjects.

The very nature of their teaching thus precluded the degree of specialization which might have enabled the tutor to become really proficient in any one subject, let alone to reach the frontiers of knowledge in a particular field and attempt to extend them.

Many fellows added to their duties as college tutors the time-consuming occupation of private tuition, which expanded considerably with the introduction of written examinations for the BA and with the requirements at Cambridge that classicists reach high standards in mathematics, and vice versa at Oxford. While numerous fellows and fellow-tutors took up this routine task to augment their income, it was often the sole occupation of young graduates who depended on the fees from private tutoring to carry them through a period of hovering at the gates of colleges in hopes of a fellowship.

According to one Cambridge professor writing in the 1840s, the 'unhappy system' of private tuition had 'contributed more than any other cause, to the very general and in some respects just, complaints which have been made of late years, of the paucity of works of learning and research which have issued from the University of Cambridge.'[1]

It is however questionable whether under more favourable circumstances, the college tutor would have been capable of extending the frontiers of knowledge, because the very system by which he was appointed resulted in the university frequently losing its ablest men. For not only did the largely self-regulating, independent colleges appoint their own tutors to teach their own students within their own walls, but the fellows selected these tutors almost exclusively from amongst themselves.

The fellows, in turn, had been chosen according to their benefactor's particular whim or interest, which was rarely related to the academic ability of the candidate. In most cases they had to be founder's kin, scholars of particular schools or born in a specific geographical region. Little could be done to alter these conditions until the pressure of nineteenth-century reforms and the clamour of a new intellectual upsurge made it imperative. At the time of the Oxford Commission of the early 1850s, out of 542 fellowships, only twenty-two were 'open'.

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[1] Peacock (1841) p. 156.

Restricted from the outset, the successful candidate for a fellowship was then subjected to further conditions during his tenure. One of these, that of celibacy, if it did not deter a candidate from taking up the fellowship, frequently led to its early termination. Another — in hollow recognition of the original purpose of fellowships — was the insistence on the fellow taking a higher degree, usually a BD. This was a demoralizing and expensive business, since by now the necessary exercises for that degree had been reduced to no more than a ritual, accompanied by payment of an onerous fee. Most fellows were further bound to take Holy Orders, which emphasized once again the close relationship between university and church, and tended to steer the fellow into a clerical career rather than a life of learning.

The lack of an academic profession

Fellowships were of fixed amount without increments, leaving their beneficiaries without material incentive to work to improve their position — rather it encouraged them to seek college tutorships and additional remuneration from private tuition. Above all, it led the abler and the ambitious to seek more rewarding posts outside the university. Since fellowships were usually awarded for life, irrespectively of residence, many fellows betook themselves and their fellowships to non-academic occupations holding better prospects.

The lack of any kind of career ladder — indeed the non-existence of an academic profession in England — was, in the words of A.H. Wratislaw, 'most singularly adapted for getting rid of the best men at the very age when they begin to be most useful.' They have 'no inducement whatever to continue their exertions, beyond the mere fact of not having provided themselves with satisfactory permanent situations in other quarters. Thus the Public Schools and other institutions have the pick of our best men. ...'[1] And as for the university professorship — which under more favourable conditions would have represented the pinnacle of his career — this was already during the young academic's student days looked upon as an unimportant by-product of the university.[1]

Bonamy Price, Drummond Professor of Political Economy at Oxford, who had long concerned himself with this question,[1] complained bitterly that to 'become a professor is to lose income, to lose pupils, to lose influence in the University as a teacher.'[2]

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[1] Wratislaw (1850) pp. 29-30.

Moreover, while their division into colleges as separate entities for teaching purposes prevented the English universities from developing a 'profession of learning', it also inhibited advances in scientific investigation for lack of research facilities. Laboratories and expensive scientific equipment could not be installed separately in each college. Essentially, the teaching of science and scientific research would have had to be carried out on a joint basis under the auspices of the university. And so, apart from its organizational conflict with the normal pattern of instruction, the development of science was also frustrated by the emptiness of the university chest.

The introduction of meaningful Bachelors degrees fails to halt the decline of the superior faculties

Eighteenth and early nineteenth-century Oxford and Cambridge were thus providing a purely 'liberal' education, almost exclusively for the sons of gentlemen of means, who were themselves to become gentlemen of means — or to occupy posts as schoolmasters or clergymen, or to take up politics. Alternatively, they might continue to study for one of the higher professions, but the quality of such a professional training at these two institutions had sunk to so low a level that it was mostly sought outside them. There was no call for higher study or research; neither decaying feudal nor early capitalist society saw the need for such sophisticated intellectual activities.

So far as examinations for the Bachelors degree were concerned, both universities had by this time been so completely taken over by the colleges, that this, their only remaining important function, had degenerated into a mere ritual without substance. Formal exercises for the MA having fallen into disuse, the BA itself had become largely dependent on 'pupilage in residence' and any meaningful examination had withered away. By the 1740s, however, under the influence of Newton's successors, the mathematical tripos was introduced into Cambridge. From then on, irrespective of the student's particular academic bent, while he continued to study the same range of subjects as before, mathematics was the one in which he was formally examined.

Even the Chancellor's medals for high achievement in classical learning could only be won by Wranglers or Senior Optimés — those who had already obtained high Honours in the mathematics tripos. And while the classical tripos was introduced in 1824, it was not until the early 1850s that classicists were permitted to gain Honours without appearing in the mathematics class lists.

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[1] For an elucidating account of the prospects of a young university teacher, see his pamphlet *Suggestions for the Extension of Professorial Teaching in the University of Oxford* (1850), which was published at the time of the University Commission.

[2] Price (1875) p. 10.

Meanwhile, mathematicians were not required to pass more than what classicists regarded as an elementary examination in Greek and Latin. No wonder classicists were complaining bitterly that Cambridge was ruled by illiterate mathematicians.

So far as Oxford was concerned, while she was not dominated by mathematics, the general state of her studies had sunk to a very low level and in the matter of degree examinations she was to lag behind her sister university for more than half a century. But when, in 1800, Oxford at last instituted examinations for her BA, she went one step further by also introducing them for the MA. These latter, however, survived for only seven years.

Tests for the BA were largely oral, but the number of candidates rose rapidly, and by the time they reached two hundred it took as long as twelve weeks to examine them. And so, breaking with all tradition — and for what would appear to have been very practical reasons — written examinations were introduced into the University of Oxford.[1] Cambridge had held its first written examinations at the Senate House as early as 1780.

There were, however, other good reasons why these measures were taken at this time. The atmosphere of radical intellectual ferment on the other side of the Channel had not been without effect on the English student. Unfettered by serious academic tests, some undergraduates had become involved in political and religious controversy, even to the extent of embracing atheist concepts. Now it was hoped to direct their intellectual pursuits into more disciplined and carefully restricted fields, determined by the coverage of the new examinations. Similar benefits were seen in the replacement of public disputations, which provided a potential platform for dangerous ideas, by written examinations, safely hidden from public scrutiny.[2]

At first Oxford examinations in classics and mathematics were set as a uniform group of papers for all candidates, but in 1807 further legislation split up these studies into the School of Classics (*Literae Humaniores*) and the School of Mathematics (*Disciplinae Mathematicae et Physicae*). The highest Honours in the latter were open only to those who had already obtained the degree of *Literae Humaniores*. Classicists on the other hand were not expected to take mathematics through to degree level, though a number of them did so by choice and some of the early nineteenth-century double firsts were indeed gifted men.[1]

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[1] Sparrow (1967) pp. 70-71.

[2] See Rothblatt (1975).

Whilst Oxford was not so dogmatic about classics as Cambridge was about mathematics, she was nevertheless producing many more first class classicists than mathematicians. And while all students at both universities had as yet to make some effort to study one another's disciplines, specialization had not reached anywhere near the level of that practised in continental universities. With the MA following 'automatically' from the BA, the only 'higher' degrees that might have involved further specialization were the professional bachelorships and doctorates, but examinations for these had deteriorated into little more than a series of cautions (dispensations on payment of fees).

Rashdall maintained that the 'practical extinction of all the higher faculties in the English universities is partly due no doubt to the absence of endowments for university teachers and to the presence of these endowments in the colleges, enabling them to monopolize that instruction which the universities themselves were unable to supply. Partly too, it is accounted for, as regards the legal faculty, by the non-Roman and unscientific character of English law,[2] and, as regards medicine, by the comparatively small size of university towns.[3] But the suppression of all effective instruction in the higher faculties was also promoted by the control which, here alone among all the universities of the world, the regents in arts — that is to say, after the decay of university lectures, the youngest masters — had acquired over the degrees in the higher faculties.'[4] For higher degrees 'mere "standing" was at last unblushingly treated as equivalent to residence and study.'[5]

Once again then, the reason for the low level to which the universities had sunk by the nineteenth century was largely sought in the fundamentally altered balance of academic, financial and political power between the colleges and the university. And, as already indicated, this vital balance, or rather imbalance, affected practically every aspect of university life. It was moreover to cause much controversy and factionalism within the universities, just as eventually it determined the very fabric of nineteenth and early twentieth-century university reform.

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[1] In 1808, Sir Robert Peel gained the first double first ever to be awarded; he was followed in 1810 by John Keble, and by Gladstone in 1831.

[2] Rashdall here refers to the need for British law, based largely on precedent, to be studied by personal observation in the law courts, rather than book work inside the university.

[3] Here Rashdall alludes to small towns like Oxford and Cambridge not having sufficiently large hospitals to provide medical students with the necessary experience of a large variety of cases. London, Edinburgh and Glasgow could in fact offer this and were certainly providing a far superior medical education.

[4] Rashdall (1895) p. 151.

[5] Ibid. p. 152.

Germany leads the way

To set this era of university reform in Britain into its proper context requires some brief observations on the very different evolution that higher education had undergone in Germany.

The German universities, like the English, were based on the Parisien model, but colleges in the English sense never developed there and residential arrangements played little part in the academic life of the student. During the sixteenth and seventeenth centuries most of the large number of individual German states instituted their own university, unwilling to recognize qualifications awarded in another state. This tended to frustrate intellectual life but facilitated the breakthrough of new ideas in individual cases. For while religious or political persecution in one state might drive its philosophers to seek asylum in another, it could also free them to set up new institutions there, as Christian Thomasius did when, fleeing from Leipzig, he founded the new University of Halle in 1694.

Pioneering the use of the native language in place of Latin, acceptance of modern philosophy and scientific thought expressed itself in a new freedom for teaching and research. Followed by the University of Göttingen in 1737, the new trend was affirmed. By the end of that century, other German universities had adopted similar innovations and, thus liberated, the great German philosophers of the eighteenth and early nineteenth centuries not only contributed to raising the intellectual level of their own institutions, but also applied themselves to improving the very fabric of the universities — their organization and their methods of dissemination and extension of knowledge.[1]

Among the greatest of these educational philosophers, who was to make a lasting impact on the development of the German university, was Wilhelm von Humboldt, creator of the University of Berlin. He believed that the state should support the university financially but that it had no right to interfere in its internal affairs. Freedom of teaching, of learning and of research were sacred, and knowledge was most fruitfully extended where it was imparted — teachers made good researchers and good researchers in turn made better teachers.[2]

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[1] See especially *Die Idee der Deutschen Universität* edited by Ernst Anrich (1956), which contains five basic programmatic memoranda on the German university, by some of the greatest German philosophers of the time.

[2] For a summary of Humboldt's views on the function and organization of universities, see his memorandum 'Uber die innere und äussere Organisation der höheren wissenschaftlichen Anstalten in Berlin' (1809-10).

The University of Berlin, founded in 1812, came to be based on these principles, at a time when the English universities were still in the 'dark ages', when the concept of state support for universities was as yet utterly alien to Britain and when the extension of knowledge was regarded as no more than an occasional by-product in institutions mainly devoted to higher school instruction.

Recognizing the fundamental role of the school in supplying the student material on which the university would build, Humboldt also introduced reforms to raise the level and broaden the spectrum of school education, by founding the modern *Gymnasium* with the requisite school leaving (university entrance) examination. To complete this transformation, he also instituted a proper university training for *Gymnasium* teachers who were now to be subjected to strict state examinations.

The nineteenth-century German university is a postgraduate institution

Students thus arrived at university after a thorough nine-year course that had terminated with the *Abitur* (practically equivalent to the English BA[1]). The nineteenth-century German university could therefore provide its students with courses of study that began where the English student left off. In short, the German university offered what in England would have amounted to 'postgraduate studies' — had they existed there.

Lernfreiheit meant that the student was free to specialize in his particular field of interest, choose his courses and even move from one university to another. So long as he could prove attendance at a number of courses and satisfy examiners by producing the requisite thesis and defending it satisfactorily in the faculty, he would be awarded his degree. Unfettered by examinations, he experienced a training in research under the supervision of university teachers who themselves were immersed in creative intellectual pursuits.

And here, in the role and structure of the German university teaching profession, the disparity between that country and England becomes even more marked. In Germany the professor, recognized and esteemed both inside and outside the university, stood at the head of the university teaching profession. A specialist in his field, a scholar and a teacher, he had reached his position largely as a result of published research and, unencumbered by responsibilities in administration or the disciplining of students, his only formal duty was to give two public lectures a week. His salary was paid by the state, and while not over-generous, could be augmented by fees from private lectures held in the university. The principle of *Lehrfreiheit* assured him of freedom of expression, at least within the precincts of the university, thereby protecting him from any interference with the subject matter of his lectures.

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[1] See Arnold, M. (1874) p. 230.

At the lower end of the teaching profession stood the renowned *Privatdozent* — a most important and solid compliment to the professoriate. An academic tutor, who had himself earned his doctorate and further academic honours by 'habilitating' as a university teacher, the *Privatdozent* was in direct contact with the student, supervising his work and also teaching him in private lectures. His promotion to assistant (extraordinary) professor and eventually the full professorship, depended on his becoming known in his own and other universities as an able scholar, through published work.

With such a research-orientated teaching profession and students who entered the university equipped with a well-rounded general education, it is not surprising that new methods of instruction should also have been introduced into German universities. The first seminars made their appearance before the end of the eighteenth century and during the nineteenth spread into all fields of study, enabling students to become intimately acquainted with the meaning of scholarship and methods employed in the extension of knowledge.

The 'inferior' arts faculty of the German university was thus totally transformed and liberated and what was now known as the faculty of philosophy, rose to take its place beside the superior professional faculties of law, medicine and theology. Moreover the Masters degree became incorporated into a new 'doctorate of philosophy'.

The requisite thesis for this degree would usually be presented two or three years after matriculation and all professors in the faculty could, if they wished, question the candidate at an oral examination. At most universities the thesis could be presented in German, though in Berlin it still had to be in Latin as late as the 1860s, a Latinist frequently being employed to translate it. At some universities foreigners could present theses in their mother tongue.[1]

During the nineteenth century, the philosophy faculty grew out of all proportion to the other faculties[2] and within it the proportion of students taking sciences almost trebled.[3] If to this growing number of scientists at the universities who underwent a specialized training to a very high level are added the large number of engineers and applied physicists who were studying at her technical institutions, it is not surprising that Germany forged ahead in almost every field of scientific endeavour.

By the mid-nineteenth century, the German university had thus totally overtaken the English — and this had not gone unnoticed by the more forward-looking academics at our ancient universities. Thus, for example, in a plea for university reform, E.A. Litton, a former fellow of Oriel College, Oxford, referred to 'the practice of the continental universities, from which, if our insular pride will permit us, we shall do well to borrow a leaf. ...' In Germany, he explained, 'there exist not only, as amongst ourselves, learned professions, but, what does not exist in England, a profession of learning, which finds its sphere of exercise in the numerous universities of that country. To encourage young men of ability to devote themselves to this profession is one of ... [their] chief objects.[1]

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[1] For a comprehensive survey of the regulations for the PhD in individual German universities, see Baumgart (1884).

[2] While in the academic year 1830-31 17.7% of all German university students were enrolled in the faculty of philosophy, by 1881-82 this proportion had risen to 40.3%. See Conrad (1885) p. 71.

[3] In 1841, 13.6% of all students in the faculty of philosophy studied science or mathematics; by 1881 this had risen to 37.1% (Ibid. p. 162).

If, in England, teaching for the BA were left in college hands, but telescoped into two years, this could be followed by two years of specialized learning under university professors. To encourage students to engage in these further studies, he suggested that 'rewards and incitements should be connected with proficiency in some one branch of knowledge under the professors. ... Perhaps a degree corresponding to that of Doctor in Germany ... would suffice for this purpose.'[2]

Mark Pattison, while not uncritical of their methods of teaching, maintained that 'as establishments for the cultivation and encouragement of the highest learning, the German universities have left everything of the kind at this moment existing in Europe behind them ... it is not as schools, but as centres of mental activity in science, that these institutions command the attention of Europe, and have become the referee to whose verdict every product of mind must be unconditionally submitted.'[3]

As might be expected, among the growing number of students from all over the world attending various German universities, the British also took their place. Whilst his own university did not provide higher courses, the keen graduate who wished to continue in more specialized studies had to seek them abroad. And where better than the one country in the world whence came the innumerable texts that he had so frequently heard cited in lectures and tutorials. The English Bachelors degree and the Scottish MA were acceptable for matriculation into any German university. Frequently British students would simply follow the example of their teachers, of whom an ever growing number had themselves studied at German universities.

The trek of British chemists to German universities was particularly marked and began well before 1850. Among the first were A.W.Williamson, Edward Frankland, Lyon Playfair, Edward Turner, William Gregory, the Muspratt brothers, J.B.Lawes, J.A. Gilbert and Warren de la Rue. The favoured teachers were Liebig at Giessen and Bunsen at Heidelberg. By the 1890s it had become standard practice for British chemists to append the

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[1] Litton (1850) p. 42.

[2] Ibid. p. 71.

[3] Pattison (1868) p. 162.

German PhD to their names.

The German influence on the development of postgraduate education in Britain — be it through the British university men who studied under her great scholars, or the immense production of essential scholarly works that emanated from that country, or the example that the Germans were later to afford of the undoubted advantages to be gained from research-orientated institutions of higher education for the economic and political power of a nation — will be discussed at many points throughout the remainder of this book.

The German influence on American postgraduate education

If the actual number of British students at German universities rose dramatically during the nineteenth century,[1] their proportion within the foreign contingent as a whole remained fairly stable, at around six or seven per cent. The proportion of students from the United States, however, rose from one per cent in 1835-6 to twenty-two per cent in 1891-2, when they numbered a not inconsiderable 446.[2]

The eighteenth-century American colleges had been little more than a shadow of the English institutions on which they were based. A narrow school curriculum along classical disciplinarian lines, offering no opportunities in specialization, ended in the BA. After three years this could be converted into a Masters degree on payment of a fee. Superior faculties only began to be introduced around the beginning of the nineteenth century.

No wonder the most forward-looking and able graduates from these liberal colleges were becoming restive and ready to seek elsewhere the more specialized and profound studies they could not find at home. Influenced by their country's recent struggle for independence from Britain, whose aristocratic and religiously restrictive colleges did not in any case appeal to them, these first American migrants were not drawn towards the universities of the 'old country'. Moreover, the advanced studies they longed for were not to be found there. News of the remarkable developments in Germany was beginning to reach the American continent and led its first scholars to venture abroad to continue their studies at that country's universities.

Their enthusiasm for what they found there — the profundity of learning and the methods employed in imparting it — naturally led them to try to introduce these into their own colleges, to which most returned as faculty members.[3] But it took several decades of migrating American graduates for the value of higher academic studies to be recognized by sufficient numbers of college teachers and administrators to become effective. Attempts to graft graduate departments on to existing institutions faltered because less forward-looking faculty jealously guarded their interests in the undergraduate colleges, and short-sighted trustees were unwilling to vote the necessary funds. On the other hand, efforts to found a national university as a postgraduate institution, to draw on the best products of colleges from all over the States, were frustrated by local patriotism and lack of enthusiasm for federal enterprises, especially during the period leading up to the Civil War.

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[1] From 26 in 1835-36 to 137 in 1891-92 (Conrad 1893).

[2] Ibid.

[3] For an account of the outstanding efforts made by some of these early pioneers to raise the level of the American college on the basis of their German experience, see, for example, Long (1935). Hillard (Editor) (1876), Howe (1908) and Hinsdale (1899).

However, Yale, having succeeded in instituting the first organized course for graduate students in 1841, twenty years later became the first to award a Doctorate of Philosophy. Significantly, the introduction of the degree resulted from an appeal addressed to the Corporation of Yale by the head of its Scientific School, John A. Porter, who had studied under Liebig at Giessen. On behalf of his faculty, he requested the establishment of an advanced course in chemistry to last three years beyond the normal college training, and 'that the degree of *Doctor of Philosophy* be installed and in accordance with the usage of the German universities be conferred on those students who have successfully pursued the above named higher course of scientific study.'

The appeal proposed further that it should also be conferred for high attainments in subjects taught by the Department of Philosophy and the Arts. The institution of the Doctorate of Philosophy would remove a disadvantage under which that department laboured in comparison with similar departments in German universities. In the opinion of the faculty, it would 'enable us to retain in this country many young men, and especially students of science who now resort to German universities for advantages of study no greater than we are able to afford.'[1]

And these very arguments employed here, which succeeded in persuading the Yale authorities to introduce the new degree, were to be used again half a century later in the campaign to introduce the PhD into Britain — not so much to entice British students away from Germany but, ironically, to divert to Britain the continuing stream of young American scholars to that country.

Why then should this exodus have continued and even gathered momentum — despite the fact that Yale's pioneering efforts were soon to be followed by Harvard, Michigan and Pennsylvania and, in 1876, by the inauguration of the University of Johns Hopkins, a graduate institution that was to grow and flourish over the following decades?

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[1] Cordasco (1960) pp. 28-29.

The American PhD spreads too fast

The American PhD, though underpinned by the elective system which now permitted specialization in the undergraduate curriculum, was with some exceptions still of a low standard. The very speed with which graduate education spread during the last thirty years of the century, the great variety of private colleges (some little more than finishing schools), the fierce competition for the small number of high calibre faculty and the general craving to append initials to one's name, all contributed to a debasing of the academic currency. Yet by the end of the nineteenth century, the PhD had become the sine qua non of American teachers, which led a distinguished professor at Harvard to declare: 'The truth is that the Doctor-Monopoly in teaching, which is becoming so rooted in American custom ... in reality ... is but a sham, a bauble, a dodge, whereby to decorate the catalogues of schools and colleges. [1]

'The dazzled reader of the list [of Doctor/teachers], the parent or student, says to himself, "This must be a terribly distinguished crowd — their titles shine like the stars in the firmament; the PhDs, SDs and LittDs bespangle the page as if they were sprinkled over it from a pepper caster ... ".

'The same belief in decorated scholarship expresses itself in two antagonistic passions, one for multiplying as much as possible the annual output of doctors, the other for raising the standard of difficulty of passing, so that the PhD of the special institution shall carry a higher blaze of distinction than it does elsewhere. Thus we at Harvard are proud of the number of candidates whom we reject."[2]

That the American PhD should so rapidly have become the characteristic qualification of the American college teacher is not surprising since it was, after all, imported from Germany, where the *Privatdozent* was invariably required to have obtained that degree. Moreover, in the materialistic atmosphere of late nineteenth-century America, those who took the trouble to study for a PhD would certainly have expected it to lead to a specific career.

Attempts to import into America the postgraduate German university - based as it was on the disciplined yet all-round academic foundation of the German *Gymnasium* — were bound to produce problems and anomalies. True, some American institutions — such as Johns Hopkins, with its generous system of fellowships to attract good students, its high salaries to attract good teachers and its visiting professors from Europe — achieved academic excellence and a PhD of considerable standard. Nor was the name of the degree corrupted there by the practice of awarding it honorarily, so prevalent in most other institutions.

But, as the contemporary American education historian Nicholas Murray

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[1] James W. (1903) p. 338.

[2] Ibid. pp. 333-334.

Butler himself stated, out of the 300 or so institutions of higher education listed by the Bureau of Education at the turn of the century, no more than six could be properly called universities, with perhaps six more in 'the making'.[1]

Indeed, great variation in standards of Bachelors as well as PhD degrees, together with the practice of awarding honorary and even bogus degrees (which permitted anyone to purchase a PhD[2]), finally led to a strong movement by the universities themselves to protect the standard of their degrees.

When the Association of American Universities was formed in 1900, one of its express aims was 'to secure in foreign Universities, where it is not already given, such credit as is legitimately due to the advanced work done in our own Universities of high standing, and to protect the dignity of our Doctor's degrees.'[3]

During its first fifteen years, the Association carried out surveys to establish the various universities' requirements for the PhD examinations, the selection of topics and the printing of theses, the awarding of Masters degrees, and the possibilities of migration in mid-course.[4]

There were no common standards of instruction such as those imposed by the state examinations which most German students worked for alongside their university degree studies. There was no licentiate such as existed in France, nor external examiners to provide some kind of common denominator as in Britain. It would, moreover, have been extremely difficult to devise such a standardizing factor in the States which, unlike these other countries, had many hundreds of institutions — some run by the state, others private, some greatly endowed, others poverty-stricken — between them all displaying so many other differences that the imposition of uniformity would have been a practical impossibility.

The Association therefore tried to devise a list of those universities and colleges which it could recommend as of sufficiently high standard to merit their Bachelors degrees being accepted by universities abroad for entry into their advanced courses. But it experienced considerable difficulties in doing so and not until 1913 was it able to send such a list (based on one drawn up by the Carnegie Foundation) to the various authorities in

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[1] Butler (Editor) (1900) Vol.I, p. xvi.

[2] See *Bogus Degrees from Bogland* (1902), which quotes, from a letter touting for agents to sell through the post, the higher degrees of some unnamed university in the state of Illinois. The PhD was available for the princely sum of £13, of which the agent was allowed to keep £1 for commission plus postage.

[3] Association of American Universities (1900) p. 404.

[4] For detailed reports on all these, see the series entitled *Journal of Proceedings and Addresses* of the Annual Conferences of the Association of American Universities, published by the Association.

Germany.[1] By then this had assumed even greater importance since the authorities were beginning to restrict the number of foreign students at their universities and becoming much more selective.

Three years later, in 1916, the same list was sent to all British universities as a recommended guide to the acceptability of American Bachelors degrees for entry into graduate study leading to higher degrees. The impact of this communication at a time when, for a variety of reasons, the British government and universities were at last becoming aware of the urgent need to organize such studies on a much larger scale then hitherto, was remarkable.[2] For once again it brought to the fore the highly anomalous situation whereby American students matriculating at German universities could aspire to the coveted PhD, while in Britain they could only hope for another Bachelors or, at most, Masters degree. But an examination of this period in which America so very directly affected Britain's university history necessitates a prior assessment of those earlier days of the mid-nineteenth-century Royal Commissions on Oxford and Cambridge and the subsequent slow and tortuous process by which the British universities were finally transformed over a period of more than sixty years.

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[1] See Association of American Universities (1913). A summary of that part of the proceedings of the 1913 Conference which relates to German recognition of American degrees also appears in the journal *Hochschul-Nachrichten* of January 1914, in an article entitled 'Fremde Hochschulen...'.

[2] See below, p. 121 et seq.

FOREIGN RIVALS FORCE THE PACE — DEMANDS OF TECHNICAL ADVANCE BOOST MOVEMENT FOR RESEARCH IN BRITAIN

The Oxford Commission of 1850 — fellowships, professoriate and higher degrees

By the mid-nineteenth century, Britain's cultural and scientific needs had clearly outgrown her system of higher education, which may have been adequate for the politically more lethargic seventeenth and eighteenth centuries but was quite inappropriate for the forward surge of nineteenth-century capitalism. That it persisted so long, even when it was being challenged by some of Oxford and Cambridge's most loyal sons, was no doubt partly due to the instruments for self-perpetuation inherent in the structure of the universities themselves. Whereas political interest and religious pressure may in the first place have handed the university over to the colleges, as Pattison maintained, the type of government which the Elizabethan and Laudian statutes had imposed upon the two universities provided the colleges with every opportunity to cling to their powers, as Hamilton so frequently emphasized. Indeed, the governing bodies of both universities, the Caput of Cambridge and the Hebdomadal Board of Oxford, were virtually in the hands of the colleges and even with growing internal pressure for reform it was well-nigh impossible for the universities to revolutionize themselves from within.

The basis for any fundamental change had to be laid by external legislation. After a protracted struggle led by the dissenters, who were still denied the right to the title of a university degree, Parliament finally set up Commissions of Inquiry into the State of the Universities of Oxford and Cambridge. The controversies that surrounded every phase of the long battle for the universities' emergence from their college-dominated state of stagnation were many and varied. They have been well documented and described in the literature on that period.[1] Here we are mainly concerned with those aspects relating to the advance of the university as a centre for research and its consequent mission and capacity to train the men to staff it — in other words, the development of facilities and courses leading to meaningful higher qualifications beyond the Bachelors degree.

In this connection it is significant that the 1850 Commissioners for Oxford included Archibald Campbell Tait, friend of Jowett and also of Arthur Stanley who became the Commission's secretary. For Tait and Stanley, after visiting Bonn in the autumn of 1839, had published anonymously a most forward-looking pamphlet in which they propounded a plan for the revival of the professorial system in Oxford. The essence of this was contained in their proposal that 'a full year should in all cases intervene between the present Examination in Arts for the Bachelor's Degree, and the act of proceeding to that Degree; and that at the end of this year, each candidate should be obliged to shew his acquaintance with some additional distinct branch of knowledge, by the production of a written Exercise or Thesis, and by approving himself in an Examination connected therewith, in the presence of the Professors to whose department the subject of his written Exercise appertains.'[1] During this fourth year devoted to special studies, the student would attend professorial lectures and generally come under the academic care of the professors. This, and the concept of a thesis and viva voce, had clearly been gleaned by Tait and Stanley from their visit to some of the German universities.

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[1] Of recent date, see especially Bill (1973).

Endowed with a repution for such radical ideas, it is not surprising that the Commissioners for Oxford, more even than those for Cambridge, should meet with great hostility from conservative elements inside the university. They were, however, able to persuade the government that some basic reforms were urgently required, and the resulting University Acts of Oxford (1854) and Cambridge (1856) at least paved the way for future reforms. Above all they changed the balance of college versus professorial representation on the governing bodies of the two ancient institutions, enabling the university at last to begin to play a more forceful role in its own government, with some hopes that academic rather than college interests might prevail.

The Oxford Commission recommended that fellows should no longer be compelled to take higher degrees since these had become academically meaningless and it was unfair to burden fellows with the cost of the fees they entailed. The radical reformers, while very conscious of the disrepute into which these degrees had fallen, favoured their resuscitation in a meaningful form. A continued insistence on fellows taking higher degrees would then return fellowships to their original purpose of supporting advanced studies. In their view, the Commission was simply reinforcing the role of fellowships as legalized sinecures.

While recommending the retention of life fellowships to help ensure their holders' deep and lasting interest in the college, the Commission proposed their termination when a fellow left Oxford for clerical preferment or other appointments for life. This latter suggestion gratified many reformers and, while it was not implemented as rapidly as they might have wished, the non-resident fellow became a less common phenomenon. In 1850 most of Oxford's 550 fellows were living elsewhere; by 1904, as many as 70 per cent of the 315 fellows at Oxford were not only resident but also engaged in university or college work.[1]

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[1] Stanley and Tait (1839) p. 2.

The Commission also made the surprising recommendation that fellows should no longer be forced to resign when they came into property. They argued that this would improve the intellectual quality of fellows, by enabling the university to 'employ capable persons though they are rich, rather than less capable persons because they are poor.'[2] They also retained the celibacy requirement because its removal might present a college head with considerable difficulties, since he relied on his resident tutors' continuous supervisory function over the undergraduates.

The Commission did, however, see fellowships as leading to the academic profession which they wished to establish through the revival of the professoriate: 'It is generally acknowledged that both Oxford and the country at large, suffer greatly from the absence of a body of learned men, devoting their lives to the cultivation of Science, and to the direction of Academical Education: it is felt that the opening of such a career within the University would serve to call forth the knowledge and ability which is often buried or wasted, for want of proper encouragement: it is evident that, for literary men, Academical rather than Ecclesiastical offices are the fittest rewards and the most useful positions. The fact that so few books of profound research emanate from the University of Oxford materially impairs its character as a seat of learning, and consequently its hold on the respect of the nation. The presence of men eminent in various departments of knowledge would impart a dignity and stability to the whole Institution. ...

'If the Professoriate could be placed in a proper condition, those Fellows of Colleges whose services the University would wish to retain, would be less tempted and would never be compelled to leave it for positions and duties, for which their academical labours had in no way prepared them, but would look forward to some sphere of usefulness within the University for which they would have been fitted by their previous occupations. A Professorship would then, in fact, become a recognised Profession.'[3]

The Commission therefore recommended the institution of a considerable number of new professorships which were in some cases to be financed by converted fellowships. This thinly disguised proposal for the diversion of college funds to university purposes naturally angered the conservatives.

In an effort to improve the basic conditions for academic advance by permitting more specialization, the Commissioners recommended the proliferation of the schools at Oxford, which led to the immediate creation of the School of Natural Sciences and that of Law and Modern

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[1] Curzon of Kedleston (1909) pp. 93 and 95.

[2] Oxford University Commission (1852) p. 166.

[3] Ibid. pp. 93-94.

History in 1853.[1] Similarly they generated the formation of an embryo faculty organization which was to be taken a great deal further by the Statutory Commissioners of 1877.

With regard to higher degrees, the Commission sent out a questionnaire to a number of professors and other members of the university which, among other matters, sought their views on the desirability of resuscitating them as tests of academic merit.

Since the MA had for so long already lost any meaning other than that of conferring membership of the university with voting rights in Convocation, a number of correspondents favoured the introduction of meaningful examinations for the degree solely on the grounds that this would raise the intellectual level of the university's decision-making body.

With regard to superior professional degrees, some opposed the re-introduction of examinations for these on the grounds that it was wrong to subject older men to such an 'unnecessary indignity' — an argument frequently echoed on future occasions when these degrees were under discussion. At the same time, witnesses were not unmindful of the considerable contribution to the coffers of the university arising from the conferment of this harmless rank.

In the event, the Oxford Commission proposed the abolition of the only remaining requirement for the MA apart from fees — the three-week residence, which they regarded as an unneccessary and useless expense without corresponding advantage. Neither did they feel it to be practical to apply real tests for superior degrees and so they left them simply as 'titles to designate the Academical standing of those who obtain them.'[2]

Pattison was later to complain bitterly that by legalizing this state of affairs, the Commission had given 'their high sanction to one of the greatest scandals of the English universities, the sale — no other word describes the transaction — the sale of our degrees.'[3]

Thus while the Commissions set up in 1850 had afforded the opportunity for controversial issues to be raised and the Report of the Oxford Commission published in 1852 clearly worried the 'conservatives', it left many reformers deeply dissatisfied. And while tractarian E.B. Pusey's party and Oxford's Hebdomadal Board were appalled at the prospect of the university's 'secularization' and the demise of the colleges, Henry Halford Vaughan's radical wing continued to work for the expansion of the professoriate and the raising of the status of the university.

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[1] At Cambridge the very threat of imminent state interference had already led to the setting up of the Moral Sciences and the Natural Sciences triposes in 1851.

[2] Ibid. p. 85.

[3] Pattison (1868) pp. 160-161.

Mark Pattison —champion of research

If the Royal Commission's report disappointed the more extreme reformers, the even greater weaknesses of the measures embodied in the resulting Act of 1854, led them to formulate stronger and more far-reaching demands. During the next quarter of a century these centred increasingly on the need for the universities to provide the conditions for creative thinking and scientific investigation. One of the principal leaders of the movement for research which was beginning to build up during this period was Mark Pattison.

Pattison, himself a tutor of Lincoln College, Oxford for most of his academic life, took many years to win through to an understanding of the important role of professorial teaching and of research in the university. He never lost his strong belief in the more intimate and direct form of tutorial teaching, but by the mid-sixties he had become an unerring believer in the twofold purpose of the university — education and learning — teaching and research. Thus he wrote in his famous *Suggestions*: 'We shall never place our university on a sure footing as long as we regard the undergraduate alone as the end and purpose of the institution. ... The professor of a modern university ought to regard himself as primarily a learner, and a teacher only secondarily. [1]... It is requisite ... that the university teacher should be first himself a man of science; that science should be his own pursuit, and the object of his own life, with its own ends and rewards, and that it should not be merely taken up that he may teach it again to others.[2]

As a first step towards raising the academic level of the university, Pattison recommended the abolition of the pass degree which at that time was the goal of seventy per cent of all students at Oxford.[3] This level of work should be relegated to the schools, as it was in France and Germany. College tutors could then turn more of their attention to the training of men whose studies were of genuine university standard. Specialization could be introduced from the beginning of a student's university training and permit the ablest to reach a sufficiently high standard to go on to what could be truly regarded as higher studies.

The nature of these would be determined by the relevant professional bodies and only after their successful completion would the university confer the degree of Doctor. So far as the teaching profession was concerned, the university itself would be 'the sole authority and impose its own conditions, therefore, on the doctors in arts.'[1] But before such a professional qualification for teachers could become a reality, the arts faculty 'must in every respect be placed on a par with the other faculties. It must be advanced from being introductory and disciplinal, to be final and scientific. Its degree must rank by the side of the degrees of the other faculties, and no longer be the road to them. Other universities,' Pattison explained, 'to avoid ambiguity, have disused the terms "Arts", and instead of "Master of Arts", give the degree of "Doctor of Philosophy".'[2]

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[1] Ibid. pp. 163-164.

[2] Ibid. p. 168.

[3] Cambridge had a rather lower percentage of poll (pass) men — approximately 60% in 1822 and by the later 1860s the proportion had fallen well below this.

Pattison realized that to translate his scheme into practice, adequate salaries would have to be offered to a much enlarged professoriate and here he proposed to utilize some of the funds currently devoted to preliminary liberal studies. Indeed, college endowments would thus be returned to their original function, the maintenance of 'men into mature age, to study, profess and represent the sciences.'[3] But while incorporated into a specific college, these university teachers would always be attached to one of a rather larger number of faculties.

Pattison's influence was considerable and others were battling alongside him. But as a later Royal Commission report explained : 'The Universities, left to themselves, had not the collective will, or indeed the statutory power, to follow these leaders along the path of change.'[4]

The economic implications of Britain's neglect of science

Meanwhile, as we have seen, in Germany the whole university system had for so long been exclusively devoted to postgraduate studies that by the second half of the nineteenth century her overall research productivity exceeded that of all other countries. Students from all over the world were converging on her universities to enjoy the higher studies which they could not find at their own.

American pioneers, in their enthusiasm for the German university, were attempting to build similar institutions upon the inadequate foundations of the American college and despite its consequent serious weaknesses a firm structure of graduate schools and departments was being established.

The question was therefore bound to arise whether Britain could continue to lag so far behind other countries in the training of her scientists and thinkers without serious loss of economic power and national prestige. In this era of vast industrial expansion, with a growing emphasis on more sophisticated scientific methods, how much longer could she neglect that increasingly vital ingredient of economic progress: human brain-power. For a long time she had relied on her easy access to raw materials and centuries-old tradition of practical know-how in manufacturing, but now her economic superiority was beginning to be encroached upon by other nations.

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[1] Ibid. p. 321.
[2] Ibid. pp. 192-193.
[3] Ibid. p. 192.
[4] Oxford and Cambridge Universities Commission (1922) p. 20.

That the threat from a number of European countries was partially related to their emphasis on the development of higher education was first recognized by no more than a small band of prophets. But during the 1870s and 80s this became too evident to continue to be generally ignored. Memorials, petitions, inquiries and reports of every sort were followed by Royal Commissions on a variety of themes related to the development of scientific advance and higher education. These in turn were followed by long drawn out piecemeal reforms, in a process that was to stretch well into the twentieth century. Whilst this period was characterized by the emergence of a number of 'liberal' forward-looking businessmen and industrialist reformers who could see that their continued prosperity demanded better-trained industrial workers at all levels, the insistent pleas by scientists and university men, for recognition and support for scientific research and the general advancement of knowledge, were at last beginning to show signs of being heard.

'This subject of the national importance of original research is one which is gradually, but surely, forcing itself on public attention ...' wrote Henry Roscoe, the German-trained chemist, in 1874. 'And yet when we come to look at the provision made for encouraging original research ... we are astonished to find that this essential provision has hitherto been almost altogether ignored. At Oxford and Cambridge thousands of pounds are each year lavished upon the encouragement of classical and mathematical attainments, whilst the claims of original research can scarcely be said to be recognised. Hence these highly endowed Universities, whilst they are justly celebrated for their critical faculties, have ceased to represent in any one direction the productive power of the country.'[1]

Roscoe held that the lack of original scientific work at Oxford was partly caused by the examination system, which tended to repress originality. Moreover, the prestige which non-scientific liberal education had enjoyed for so many generations was self-perpetuating. The public schools which provided the university with its student population and ultimately also its staff, looked down upon science. They had no facilities for its proper instruction and, what was worse, under such poor conditions, the little science taught was of minimal use.[2]

Long before, in a review of Babbage's *Reflections on the Decline of Science in England* ..., the Scottish physicist Sir David Brewster, had lamented that the great majority of discoveries, such as those by Watt, Priestley, Cavendish, Dalton, Herschel and Faraday, were being made outside the universities. He proposed the creation of professorships 'for the maintenance of men of genius, whose duty should be limited to the advancement of science by their original researches, and to the instruction of the young men who held out the promise of great acquirements.'[1] For he believed that if such great inventors as at present worked under immeasurable difficulties in improvised laboratories could be brought into the universities, they would in turn attract 'crowds of pupils, not only from every part of the kingdom, but from the remotest corner of Europe.'[1]

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[1] Roscoe (1874) pp. 23 and 38.

[2] In the early 1860s Eton employed 24 classics masters, 8 in mathematics, and 3 to cover all other subjects (Cardwell 1957 p. 81).

In 1831, with Babbage and others, Brewster founded the British Association for the Advancement of Science, which soon came to play an important role in the encouragement of scientific and technological research. The parallel activities of the Royal Society of Arts, which had been founded in the mid-eighteenth century as the 'Society for the Encouragement of Arts, Manufactures and Commerce', also made a positive impact on Britain's attitude to scientific advance.

By organizing the first great International Exhibition in London, in 1851, the Royal Society of Arts helped to bring to light the growing weaknesses in Britain's industrial might compared with her rivals. And, as in the manner of those days, a series of lectures popularizing the results of the exhibition was held in the major cities of Britain, where speakers such as Lyon Playfair demonstrated the lessons to be learnt: Britain's advantage of plentiful supplies of cheap raw materials was now being rapidly reduced by improvements in transport that were making them equally accessible to her rivals. 'Industry must in future be supported, not by a competition of local advantages, but by a competition of intellect.' And Playfair maintained that 'all European Nations except England have recognized this fact. ...'[2]

But it took a further twelve years, and the traumatic experience of a greatly deteriorated British performance at another International Exhibition, before Lyon Playfair's warning was heeded by the relevant authorities in Britain. As a juror at the Paris Exhibition of 1867, he made strong representations to the Royal Commission of Inquiry into Schools, which was at that time deliberating in London, under the chairmanship of Lord Taunton. In a written submission Playfair unequivocably attributed the growing superiority of France, Prussia, Switzerland and other countries in the chemical arts as well as in mechanical and textile manufacturing to the stress they laid on an effective system of higher instruction.[3] His communication and those of other jurors at the Paris Exhibition were the subject of a special interim report of the Commission[1] which in turn helped Bernhard Samuelson the following year to persuade the House of Commons to set up a select committee to investigate technical education abroad. Its report provided much useful information and also resulted in public discussion in most of Britain's major cities.

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[1] Brewster (1830) p. 328.

[2] Playfair (1852a) p. 193.

[3] Playfair was well informed about education on the continent. Not only had he trained under Liebig at Giessen, gaining his PhD there in 1841 at the age of twenty-two, but he had also studied methods and gathered data on foreign technical education during a tour of the continent which he had made at the request of Prince Albert, following the 1851 exhibition.

Agitation for the reform of scientific and technical education

This theme of the importance of higher technical and scientific education for Britain's economic and political well-being was beginning to be taken up at every opportunity. Thus in 1871, Prussia's resounding victory over the French prompted Thomas Arnold to exclaim that her successful handling of the war with France represented *'The fruits of the effectiveness of the German university system'* and conversely, that 'our breakdown at the Crimea is distinctly traceable to the ineffectiveness of our superior education, failing to illuminate the professions and, through them, callings subsidiary to the professions, with the light of scientific thought."[2]

Soon the critical depression of the 1870s was to make Britain's precarious economic position even more evident, and in 1881, a Royal Commission was set up under the chairmanship of Bernhard Samuelson 'to inquire into the instruction of the industrial classes of certain foreign countries in technical and other subjects for the purpose of comparison with that of the corresponding classes in this country; and into the influence of such instruction on manufacturing and other industries at home and abroad."[3] Henry Roscoe, who was a leading member of that Commission, was largely responsible for the strong emphasis its report gave to the role of university research in saving Britain's prestige in the field of technology.

Meanwhile parallel and closely associated activities for an inquiry into scientific research and instruction had met with unusually rapid success. In 1867, a special committee of the British Association had issued a report on 'the best means of promoting Scientific Education in Schools'. In reviewing this, Michael Foster remarked on the 'undeniable fact that, judged by the value of her yearly contributions to the advancement of science, England, at least as far as the natural and experimental sciences are concerned, seems in danger of sinking to the condition of what in political language would be called a third or fourth rate power. Our greatest men are perhaps still greater than those of any other nation; but the amount of quiet, solid, scientific work done in England is painfully less than that done in Germany, less even than that done in France. ...'[4]

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[1] See Commissioners for the Exhibition of 1851 (1867) Appendix 0.
[2] Arnold, T. (1872) pp. 7-8.
[3] See Magnus, P. (1910) p. 92.
[4] Foster (1867) p. 487.

What we suffered from more than anything was the 'want of scientific training' and the want of 'breadwinning scientific careers'. It was because the path to becoming a good scientist was so exceptionally thorny 'that our foremost men are so exceedingly good, since all the weaker minds succumb in the struggle for scientific existence.' But we could not afford this costly process of elimination and we needed more trained scientists. At present the best men went abroad to seek what they could not get here — a good and thorough scientific training and a German degree![1]

In 1868 Colonel Alexander Strange, who had also been a juror at the Paris exhibition the year before, addressed the Mathematics and Physics Section of the British Association on 'the necessity for State intervention to secure the progress of physical science'. This resulted in the British Association setting up a committee of inquiry consisting of a galaxy of science politicans such as Norman Lockyer, Playfair, Frankland, Tyndall, Strange, Kelvin and Huxley. Its recommendations were submitted to the Conference of 1869, which agreed that: 'The full influence of the British Association for the Advancement of Science should at once be exerted to obtain the appointment of a Royal Commission to consider ... the character and value of existing institutions and facilities for scientific investigation and the amount of time and money devoted to such purposes' and what could be done to expand and improve these.[2]

And so, early in February 1870, a deputation consisting of the entire council of the British Association called upon the Lord President of the Council, Earl de Grey, to put their case.[3] Four months later, the Royal Commission on Scientific Instruction and the Advancement of Science — the Devonshire Commission — was set up, with Norman Lockyer as its secretary. It sat for five years and issued eight reports. It took evidence from innumerable witnesses — scientific, industrial and educational experts — and much of what was said was highly relevant to the development of postgraduate education in Britain.

This was indeed a triumph for the British Association as a pressure group for the advancement of science. But to assess the real significance of the Devonshire Commission's work some account must be taken of such little progress as had in fact been made during the decades leading up to the 1870s.

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[1] Foster (1867) pp. 487 and 488.

[2] Lockyer, T.M. and W.L. (1928) pp. 53-54.

[3] An enlightening report of this interview is to be found in an editorial article in *Nature* (see Lockyer 1870). This journal had been founded most opportunely in 1869, and under Norman Lockyer's editorship championed the advancement of scientific and technical research and education.

The Government School of Mines and the Royal College of Chemistry

One of the British Association's earliest successes had been its campaign for the establishment of the Mining Records Office and a museum to aid the progress of geological work. These two organizations, staffed by A.C. Ramsay and Edward Forbes under the direction of Sir Henry de la Beche, proved to be of such positive value that in 1851 the government was persuaded to set up a School of Mines, one of whose functions was to be the study of the twin problems of productivity and safety in the mines. Playfair joined its staff from the beginning and in its first year it attracted 15 matriculating and 49 occasional students.[1] Its title, its location and its fortunes were to change several times in the years to come but the names and work of Ramsay and Forbes's successors — Edward Frankland (the Liebig and Bunsen trained chemist), T.E. Thorpe (who had been a pupil of Roscoe and Schorlemmer) and above all Thomas Huxley (who exerted a progressive influence on the institution for almost thirty years) will always be associated with it. And through these great teachers, the Royal School of Mines became one of the few institutions in England where students could aspire to something more than the pure gathering of information for reproduction at examinations.

Alongside it there had also developed another important scientific institution which pioneered the concept of the research laboratory in Britain. The Royal College of Chemistry had a very special bearing on the training of scientific research workers in Britain, since from the beginning it gave shelter — in the truest sense of that word — to what might be regarded as some of Britain's earliest research students.

When in 1842 — following upon the publication of his celebrated work *The Chemistry of Agriculture and Physiology* — Liebig visited England as a guest of the British Association, he lectured on his researches into agricultural chemistry. Among his audience were farmers and landowners and other interested persons who, much impressed by what they heard, initiated a movement to set up an Institution of Chemical Research in England. By 1845 enough money had been contributed for the College of Chemistry to commence its work. From the beginning it was headed by A.W. von Hofmann, who had been a fellow pupil of Playfair's under Liebig at Giessen. Hofmann was at this time a *Privatdozent* at Bonn and somewhat reluctantly exchanged his splendid career opportunities in Germany for a post in a country which had as yet shown little inclination to value the work of a research scientist.

Running the new institution on the lines of Liebig's famous laboratory, Hofmann appointed his best students to assist him in his researches and engage in the elementary instruction of the younger students. This, in turn, resulted in an impressive new generation of competent researchers —

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[1] See Reeks (1920).

Frankland, Warren de la Rue, Odling, W.H. Perkin and F.A. Abel among them. Abel was one of those first twenty-six students who entered the college in 1845 and has captured for us better than any official reports or statistics can convey the significance of the experiences gained by those earliest postgraduate students in Britain.

'There can be no doubt,' he said, 'that one of Hofmann's talents which most importantly contributed to his eminence as an industrious and successful investigator, was his faculty of gauging the powers and special qualifications of those who worked under him; it enabled him to select the fittest workers to aid him in the rapid and successful development of a great diversity of researches, and also to direct their special talents and energies into channels which his prolific mind suggested, and the exploration of which, by those whose powers he, in the first instance, discovered and fostered, laid the foundation to the practical usefulness, or the scientific eminence, which many have attained who are now glad and proud to remember that they were the pupils of Hofmann.'[1]

While Hofmann, to maintain the interest of the benefactors of the laboratory, had to engage his students in the more immediate applied work of improving analytical methods and apparatus, 'there is no question that he best loved to place in the hands of his most capable pupils one or other of the many problems in organic chemistry in the solution of which he took a paramount interest.'[2]

In the light of these methods of work with his research students, it was logical that Hofmann should also have initiated an embryo research degree. Whilst the Royal College of Chemistry was not at that time attached to the university and therefore could not offer degrees as such, it did provide a Certificate of Attendance for the more junior students which was recognized for purposes of admission to examinations for a London University degree. More importantly, it also awarded a Testimonial of Proficiency for advanced students who had 'conducted one original chemical investigation, at least, in the Laboratory of the College, ... [which had] been deemed worthy of publication in the transactions of the Chemical Society of London, and in the publications of the College.'[3]

The country was not yet ready to appreciate Hofmann's endeavours. Whilst subscriptions had been secured on a wave of enthusiasm for chemistry as the panacea for all the ailments of agriculture, the benefactors' interest in the work of the college soon waned. There was a continuous shortage of money, Hofmann's salary was reduced and in 1853 his college was merged with the Government School of Mines. He continued to struggle on valiantly for another decade, and then returned at last to highly successful and honoured positions at Bonn and later at the University of Berlin.

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[1] Abel (1896) p. 592.

[2] Ibid. p. 593.

[3] Royal College of Chemistry (1849) p. xxii.

London pioneers the science faculty and the DSc

No doubt the presence in London of these colleges, whose teaching staffs included a number of the country's leading science politicians, had a positive effect on the university. Moreover, the peculiar status of the University of London as a federal institution in some respects also endowed it with greater flexibility.

It set the examinations but the colleges appointed their own teachers and provided candidates for the university's degrees.[1] All members of the university's Senate were appointed by the government. This had the great advantage that it could draw on all manner of talented men who could bring fresh minds to bear on the work of directing the university. And indeed, this appears to have been the case, for its first members included such formidable personalities as Nassau Senior, Faraday, Dalton and Arnold of Rugby.

No doubt this was an important factor contributing to London University's becoming the first in the country to establish a science faculty, complete with its own degrees.[2]

Originally London had been set up with the express purpose of providing a university free of the traditional and constitutional fetters that held back academic progress at Oxford and Cambridge. From the very beginning, in the 1830s, she had insisted on an 'earned' Masters degree and her BA also entailed a more severe examination than that at Oxford and Cambridge. According to a contemporary observer, it embraced as much classics as the first and as much mathematics as the second.[3] Not surprisingly then, the need for more specialization was felt keenly by those concerned with higher scientific instruction in London in the mid-1850s.

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[1] This 'external' nature of the university had the advantage (or as some thought — the disadvantage) of students from many other institutions, in and outside London, being able to sit the examinations and obtain London University degrees. Up to 1858, a Certificate of Attendance at a recognized college (including from 1849 onwards some in the British Empire) was required from candidates for degree examinations. After that time, anyone who had passed the matriculation examinations and paid the required fee could sit the degree examinations, even after purely private study. From 1900, when London was reconstituted as a teaching university, students attending 'Schools of the University' in London were classified as internal, while all others, including private students, took the external degree (see Logan 1962). See also below, p. 90.

[2] This was in advance even of Prussia, where the first faculty of natural sciences was hived off from the philosophical faculty in the University of Tübingen in 1863.

[3] The Report of the Oxford University Commission, 1852 (1852) p. 360.

Thus in July 1857, at a time when changes in the constitution of the university were under consideration, a memorial was presented to Senate[1] which was to prove highly significant for the study of experimental science in London and to have repercussions far beyond that university. It began by pointing out the anomalies in the existing system of degrees in arts which afforded insufficient encouragement to the study of experimental science. While the successful Bachelor of Arts might compete for a scholarship in classics, mathematics or natural philosophy — in chemistry he could only aspire to a book prize of £5 and no recognition at all was given to those talented in experimental physics. Moreover, while there was no provision for the chemist or the experimental physicist to continue his studies beyond the BA degree, those specializing in classics, mathematics and natural philosophy, or in moral and political knowledge, could go on to the degree of Master of Arts.

The petitioners regretted that as a result 'many of our most distinguished students who devote themselves especially to Experimental Science, either take no Degree at all, or content themselves with that of Bachelor of Arts or go to Germany for that of Ph.D.'[2]

They therefore suggested that a scholarship equal in value to those given in classics and in mathematics be awarded for proficiency in physics and chemistry and that 'a Degree equivalent in value to the present Degree of M.A., be conferred for proficiency in Physics and Chemistry, and such Degree to be called 'Doctor Scientarum' — D.S.'[3]

Senate responded by setting up a committee to consider the questions raised by the memorialists.[4] This in turn received a further memorial pleading for the establishment of a science faculty and degrees which would recognize science as a profession and enable students to specialize in physical or biological sciences at the level of the Bachelors degree.

The signatories to the first document, some of whom also signed the second, included A.W. Hofmann, John Tyndall, Lyon Playfair, Warren de la Rue, W. Sharpey, Charles Lyell, A.C. Ramsay, Thomas Huxley and B.C. Brodie. These eminent scientists were subsequently asked to appear before the Committee to give their views, among other things on the following thorny questions: Should specialization occur immediately after matriculation? Should there be any intermediate examination covering a broad field? Should Greek or Latin or both feature in the university science course at all? Should a modern language replace one or other of these? Should there be a higher and a lower degree in science?

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[1] On 8 July 1857. The original exists in the University of London Archives: Memorials 1840s — 1985s, Science, I.

[2] Ibid.

[3] Ibid.

[4] For a full account of its work see London, University of (1858).

While their replies varied considerably, it was generally agreed that much more importance should be attached to the study of experimental science, that specialization should begin well before the final Bachelors degree examination and that there should be a qualification for scientists beyond the first degree.

In the event, a doctorate by written examination in a restricted field of science was decided upon, and a Bachelor of Science degree which was as yet very general. It involved a first BSc examination, requiring a competent knowledge of physics, chemistry and biological sciences as well as logic and ethics. The second BSc, the Honours examination, permitted a somewhat higher degree of specialization.

Faraday, who had been a member of London University's Senate since its inception and had played a prominent part in the Senate Committee on Science Degrees, whilst clearly delighted with the Memorialists' success, continued to be troubled by the problem of achieving a correct balance between generalization and specialization: 'The subject is beset with difficulties,' he remarked, 'for when the breadth and depth of science came to be considered, and an estimate was made of how much a man ought to know to obtain a right to a degree in it, the amount in words seemed to be so enormous as to make me hesitate to demand it from the student, and though in the D.S. one could divide the matter and claim eminence in one branch of science, rather than good general knowledge in all, still in the B.S. ... a more extended though a more superficial acquaintance seemed to be required. In fact, the matter is so new, and there is so little that can serve as a previous experience in the founding and arranging of these degrees, that one must leave the whole endeavour to shape itself as the practice and experience accumulates.'[1]

Oxford's Mark Pattison, while appreciating it as a positive advance, was highly critical of the generality of the London science degree when a decade later he pronounced the title of Bachelor of Science 'an absurdity. A degree in "science", which is no science in particular, is not an intelligible mark or designation. But the thing intended to be done is good, and the example ought to be followed by us.'[2]

Owens College encourages research at Manchester

From 1860 onwards then, students could register for the BSc and the DSc of London University. By now London accounted for students as far away as Montreal and Calcutta, while at home — and perhaps of more significance for the progress of science and the general advancement of knowledge in

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[1] In a letter to the Reverend John Barlow (probably written in 1859), quoted in Thompson (1898) pp. 275-276.

[2] Pattison (1868) p. 268.

Britain — it embraced students from all over England, Scotland, Wales and Ireland.[1]

One university teacher in particular welcomed the new degrees in science which became available to his students, though he was extremely critical of the DSc by examination and later played his part in transforming it into a research degree.[2] Henry Roscoe, after obtaining a PhD at Heidelberg under Bunsen, had become Professor of Chemistry at Owens College at the age of twenty-four. Not only did he champion the cause of scientific research and train first class chemists at his own college at Manchester, but he also exerted an influence far beyond it — on innumerable government and university commissions, spanning several decades that stretched into the twentieth century.

And while Roscoe was concerned with physical sciences, his colleague at Owens, A.W. Ward, was to lay the foundations for the development of research-oriented training in arts. Ward, scholar and educationist, was a cousin of Matthew Arnold and received his school education in Germany. After studying at Cambridge, he was appointed to a chair in English language, literature and history at Manchester in 1866.

If this seems a broad range for a professor to have covered, it is interesting to note that the brief of his predecessor in the chair, A.J. Scott, included additionally the subjects of Hebrew and logical, mental and moral philosophy. In the early days of Owens College the earnest wish of some of its professors to engage in research and encourage their students to do likewise must have been much frustrated by the broad responsibilities assigned to them.

Nevertheless, it was Roscoe and Ward's belief in the vital role of research, together with the active support of economist W.S. Jevons,[3] that paved the way for those next great partners in science and arts — Schuster and Tout — under whose guidance the cause of research was to continue to flourish in the leading civic university of the country.

'Mature study and scientific research' at Oxford and Cambridge

Meanwhile little progress had been made in the older universities since those distant days in the Oxford of the mid-twenties, when Daubeny had to pay out of his own pocket to equip the first 'Chemistry Laboratory' with even the most primitive apparatus. In their refusal to acknowledge the value of physical sciences either as an important ingredient in a liberal education or as a valuable discipline in their own right, the college authorities were partially guided by their inability to envisage a role for their tutors in the teaching of chemistry and physics.

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[1] The first candidate entered in London University's register for the DSc was Gustav Knecht, 39, born in Zürich, who was reading for the degree by private study. In later entries, students from Owens College, Manchester and the Royal School of Mines feature prominently.

[2] See below, pp. 46-7.

[3] Jevons was Roscoe's cousin and joined him at Manchester the same year as Ward, in 1866.

It was therefore only when William Cavendish became Chancellor of the University of Cambridge in 1867, and donated the sum of £6,300 for the express purpose, that a laboratory was built and equipped for work in the physical sciences at that university. The Cavendish Laboratory opened in 1874, with J. Clerk Maxwell its first director and also the first incumbent of the new chair of experimental physics, and with Arthur Schuster as his first research student.

When Lord Rayleigh followed Maxwell in 1879, his policy of engaging demonstrators to relieve him of some of the more elementary teaching was to bear rich fruit. For not only did this enable the professor to devote more time to his research, but it also developed splendid scientists among the demonstrators so appointed — the first two being R.T. Glazebrook and W.N. Shaw.

In 1884, at the age of twenty-eight, J. J. Thomson became director of the laboratory, a position he was to hold for the next thirty-five years. But due to the poverty of the university and the reluctance of the colleges to increase their contribution to its expenses, what now became the great training ground for world-famous physicists[1] continued to be run on a shoe-string.

In Oxford, where the Clarendon Laboratory was opened in 1872, similar difficulties had been encountered. Henry Acland, its persistent protagonist, relates the pitiful tale of how — after eleven years of campaigning — at the critical closing stages, when the money had to be voted for the installation of gas burners to light the building, Convocation only just passed the necessary resolution — by two votes![2]

By the early 1870s, Pattison and his friends, who by his own admission had earlier been 'blind' to 'the claims of science in the realm of knowledge'[3] had become convinced of the vital role of scientific research in the university. He lent his name to a movement which, though shortlived in itself, played a considerable role in crystallizing the demands of the champions of research. It was on 16 November 1872 that a meeting of 'members of the Universities and others interested in the promotion of mature study and scientific research in England' was called — not in Oxford, or in Cambridge, but on neutral ground — in London. This gathering, held at the Freemason's Tavern in Lincoln's Inn Fields, was timed to coincide with sittings of the Cleveland Commission, set up by Gladstone to inquire into the revenues and property of the Universities of Oxford and Cambridge. It had been called in response to a preliminary resolution signed by some seventy learned men who believed that ' the chief end to be kept in view in any redistribution of the revenues of Oxford and Cambridge is the adequate maintenance of mature study and scientific research, as well for their own sakes, as with the view of bringing the highest education within reach of ali who are desirous to profit by it.'[1]

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[1] The popularity of the Cavendish Laboratory among science scholars grew extremely rapidly at this time. During the first five years of the 1851 Exhibition Science Scholarship scheme (1891-95), only 2 out of 29 physicists elected to go to the Cavendish, but during the following 25 years, 60 out of 103 did so (see Wood 1946 p. 28).

[2] See Acland and Ruskin (1893) p. iii.

[3] Pattison (1885) p. 306.

Mark Pattison, in the chair, was careful to explain that the meeting was not in any sense political but had purely academical aims. Nor was it taking the initiative, but rather wishing to discuss the direction that might properly be taken by the reforms which could arise from Gladstone's Commission. Among those present were Brodie, Rolleston, Burdon Sanderson, Huxley, Appleton, Lankester, Henry Sidgwick, Lockyer, Carpenter and Seeley. A very full agenda included such topics as: research in physical science compared with that in other sciences in England; the national importance of mature study as a means of increasing knowledge; the importance of research in improving the quality of education; the abolition of prize fellowships; the desirability of introducing new branches of study and the better organization of teaching in the already existing ones.

Amongst the resolutions passed at the meeting was one confirming that 'to have a class of men whose lives are devoted to research is a national object'. And in this connection Professor Seeley demonstrated how the current mode of awarding fellowships impeded the creation of such a class of *Gelehrter* or *savant*. The term itself had to be borrowed from the German or the French! he remarked.[2] The one definite object of university reform was to create the conditions for an English *Gelehrter*, not only by finding him an appropriate name but, above all, by finding him a career.

Pattison introduced the resolution 'that a sufficient and properly organised body of resident teachers of various grades be provided from the

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[1] University Endowments (1872); The Organisation of Academical Study in England (1872); University Organisation (1872); The Functions of our Universities (1872).

[2] And Seeley might well have referred to the large number of other 'untranslatable' concepts that have crept into our language from the German vocubulary of intellectual pursuits. Words such as *Lernfreiheit*, *Lehrfreiheit*, *Bildung*, *Weltanschauung*, *Gelehrter* and above all the term *Wissenschaft* appear again and again in our literature, and, bearing witness to the pioneering work of the German universities, are still commonly used in Britain to-day.

Fellowship Fund.' At the time of the Royal Commission twenty years before, the question had been mooted as one of a professoriate versus a tutoriate and had been regarded as 'a revolution in the educational institutes of the University'. Since then some new professorships had been created, but these were still outside the system because the colleges had not been reformed. The question now being raised was the conversion of the university into a centre of mature study — a very different proposition, which required more radical changes. Indeed, Pattison believed that such a transformation of the university's teaching structure might well be built upon an English equivalent of the *Privatdozent*.

The meeting adopted all the resolutions with enthusiasm and to promote and develop the ideas they embodied it was decided to form a Society for the Organisation of Academical Study, with C.E. Appleton as its honorary secretary.

Appleton and the endowment of research

Appleton, an Oxford man who had spent some time at Heidelberg and Berlin, was deeply concerned about the shortcomings of the ancient English universities in the field of mature study and research. Pattison regarded him as 'the missionary of the movement in favour of what is called "research"', and attributed to him the coining of the phrases 'mature study' and 'endowment of research'.[1]

In 1869, the same year in which Lockyer began the publication of his scientific periodical *Nature*, Appleton founded the learned journal *The Academy* which, though somewhat different in approach, might be regarded as *Nature's* literary twin. Like his friend Lockyer, Appleton used his journal as a vehicle to draw the attention of influential people to the urgent need to support advanced study and research.

At first the new Society for the Organisation of Academical Study found considerable support amongst progressive, scientific and academic circles, but soon the opposition gathered force. As Pattison explained, 'not only those who, being in possession of the endowment preferred to have it without "research", but all the "teaching" interest was disturbed by being called upon to learn before it taught.'[1]

And with strong disagreements between the 'Oxford researchers' and the 'Cambridge tutors', as well as bitter arguments between Pattison and Appleton on the one hand and the non-Oxford plebeian Roscoe and his friends from Manchester on the other, the Society soon disintegrated.[2]

But Appleton continued his campaign with the publication in 1876 of the

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[1] See Pattison (1881).

[2] See Roll-Hansen (1957). Also *The Times* leader of 17 December 1872.

Essays on the Endowment of Research[1] and the circulation of his draft 'Scheme for the Endowment of Scientific Research', which he presented to Oxford's Statutory Commissioners the following year. Since at this time the issue of the 'endowment of research' was closely related to the redistribution of college resources, the thorny question of college fellowships was once again thrown into sharp relief. But as Lang remarked, 'Englishmen, as a rule, believe that endowed cats catch no mice. They would rather endow a theatre than a *Gelehrter*, if endow something they must. They have a British sympathy with these beautiful, if useless beings, the heads of houses, whom it would be necessary to abolish if Researchers were to get the few tens of thousands which they require.'[2]

The 1850 Commissions had gone some way towards democratizing these ancient foundations, opening many of the fellowships to a much larger catchment area by removing some of the more pernicious restrictions of geographical location, birth and schooling. They were, however, still no more than prizes for past work for the Bachelorship.

In their evidence to the Statutory Commissioners for the University of Oxford in 1877, a number of witnesses pleaded for some fellowships to be used to provide serious advanced students with the necessary subsistence to enable them to engage in research. As an example of what was required, C.E. Appleton quoted the three-year Radcliffe Travelling Fellowship, which was currently awarded to the holder of a distinguished degree in physical sciences who would be expected — at the end of his travels abroad — to produce 'a piece of new knowledge'. He pointed out that a former Radcliffe Fellow, E. Ray Lankester, had carried out excellent researches on the development of mollusca during his tenure![3]

Appleton's 'Scheme' included detailed proposals on who should be eligible for awards and how they were to be chosen, how much support they should receive and what kind of work they could be expected to do — and finally also on who was to decide on whether a fellowship was to be renewed. He referred to that small number of young men who, after receiving a liberal education were found to 'have a particular aptitude for study and for a particular kind of study'. These would provide 'the raw material — the first draft, so to speak, of the scientific class of the next generation'. Because there was no career for the *savant*, these men were at present being wasted, lost to society, because they were drafted into the practical professions — educational, legal, medical or civil — in order to make a living.

He proposed that in the first instance the fellow should be chosen by the professor who knew the student concerned; anyone with experience could easily pick out the right men. To begin with, they should be paid enough to live on, if not to marry, and only 'for a limited time and for the performance of a specific piece of research, to be chosen of course by the candidate, subject to approval' by a special Board. The work was to be carried out under the eye of the professor for a year or two. If the resulting research report, written up in the form of a paper, was accepted by the respective learned society then the grant could be renewed at a slightly higher level for a further limited period. This process would continue for ten to twelve years and if the work of the research fellow was still satisfactory, a permanent appointment could then safely be made.[1]

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[1] A collection of essays by various authors, including Appleton and Pattison: *Essays on the Endowment of Research* (1876).

[2] Lang (1890) p. 249.

[3] Oxford University Commissioners (1881) p. 31.

The commissioners, while not unsympathetic to the idea of research fellowships as such, were apprehensive about the difficulties that a board would encounter in trying to decide on the renewal of a fellowship. Would they not be inclined to keep a man because they would not want to lose him his livelihood? These and other doubts led to their evading the problem and fellowships continuing to be awarded to good Honours graduates on the basis of examinations. They did, however, remove the condition of celibacy and also reduced the fellow's terms from a freehold for life to a period of seven years. But the main issue was lost. As the German Professor of Comparative Philology at Oxford, Friedrich Max-Müller, aptly commented, while the fellowships continued to be based on a principle that excluded 'payment by results', often 'there remained the payment only, but not results.'[2]

The protagonists of research fellowships who had given evidence before the Oxford Commissioners had not attempted to relate these to the awarding of higher degrees, nor did they conceive of the proposed research fellows as bona fide students. They were to gain experience and to produce useful results. They were to undergo an apprenticeship and at the same time to make a contribution to the advancement of knowledge. The emphasis here was on the endowment of research — financial support to enable those most suited to it to devote themselves to the advancement of science. The issue of improving undergraduate education to produce the raw material from which these embryo research workers could be chosen was not raised here, nor was the formalization of studies beyond the Bachelors degree.

The Devonshire Commission recommends research degrees

Yet the need for advanced studies and the inadequacy of the generalized liberal education provided by the ancient English universities was increasingly recognized, as economic progress demanded more specialized knowledge in all fields. And, before long, more concrete demands for a

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[1] Ibid. p. 392.

[2] Max-Müller (1901) p. 261.

training for research workers — for *postgraduate* studies — began to be formulated.

Thus the mathematician Sir Thomas Muir in the year 1884: 'We recognise two of the functions of a University — *instruction* and *research*; we ignore, so far as mathematics is concerned, a third and equally important function — *instruction in research.*'[1] He deplored the habit amongst newly graduated Scottish mathematicians of repairing to Oxford or Cambridge to spend the following four years obtaining a Bachelors degree on top of their Scottish Masters. 'Is it altogether absurd,' he asked, 'to suggest that a graduate who gains a scholarship should remain during the tenure of his scholarship in his own university, there to grow in knowledge under his favourite professor's guidance, to learn to teach, to be initiated into independent research...?'[2]

That same year, in his presidential address to the Chemical Society, W.H. Perkin who had many connections with Germany and also sent two of his sons there to study, spoke of the importance of rewarding such postgraduate work with appropriate higher qualifications: 'The degree of Doctor of Philosophy has undoubtedly done a good deal to further chemistry in Germany, necessitating, as it does, the prosecution of original work, and ... if something analogous to the Ph.D. could be inaugurated in this country, it would help to further chemical science here also.'[3]

And so, at last, the demand for the *introduction of advanced studies culminating in a research degree* of the continental type had been clearly defined — by a physical scientist who was himself a product of the Royal College of Chemistry! And it was similarly the evidence submitted to the Devonshire Commission on Scientific Instruction and the Advancement of Science, rather than to the Oxford Statutory Commissioners, which resulted in a concrete recommendation for such degrees to be instituted. Witnesses such as Frankland, Roscoe, Brodie, Burdon Sanderson, Warren de la Rue, Carpenter and C.W. Siemens — to name but a few — were minutely questioned on their views regarding the causes of the widely differing progress of science in Britain and on the continent, and on all the complex factors involved.[4]

The Commission, headed by William Cavendish (Duke of Devonshire) and including among its members Thomas Huxley and Bernhard Samuelson, with Norman Lockyer as its secretary, was, as might be expected, sympathetic to much of the evidence which their own experience had clearly confirmed over and over again. A summary of the relevant points from their third and seventh reports, which included most of their recommendations relating to the universities,[1] demonstrates the Commission's understanding of the basic problems involved and their resolution to tackle them in a practical manner.

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[1] Muir, T. (1884) p. 11.

[2] Ibid. p. 12.

[3] Perkin, W.H. (1884). For a most enlightening discussion on the shortcomings of the English system of training chemists and the differing attitudes among German and English chemical manufacturers towards university trained scientists, see the lively correspondence in *The Times* beginning on 25 August 1896.

[4] A verbatim report of the evidence of these and other witnesses is to be found in Devonshire Commission (1871-1875).

They were acutely aware that if an adequate standard was to be reached by first degree level, the basis of a liberal education would have to be laid before the student embarked on his university course. They therefore recommended a school leaving examination analogous in some respects to the German *Abitur*, which would 'mark the limit between school studies and University studies, so that the student whose performance in the examination had come up to a certain standard, might be supposed to have acquired such an amount of general culture and scientific knowledge as to entitle him, henceforward, to be left as free as possible to choose for himself among the great lines of literary or scientific study.'[2]

To encourage students to take up the latter, the Commission recommended that the number of university scholarships offered to natural scientists should be increased: 'The state of the case appears to be that the Colleges do not offer scholarships for Natural Science because they fear they would not get good candidates from the schools, and the schools do not teach Natural Science because they are afraid of injuring the prospects of their pupils by diminishing their chances of obtaining a scholarship.'[3] Fellowships fared similarly. In the last twenty years, out of two hundred Oxford open fellowships, only twelve had been awarded to students of the natural sciences. Small wonder that the recently established Honours Schools in Sciences were so slow to achieve a good following. For who would opt for a degree in science if the chances of a subsequent fellowship were less than one in fifteen as compared with that of an arts graduate.

With regard to advanced studies, the Commission reported: 'On no point are the witnesses whom we have examined more united than they are in the expression of the feeling that it is a Primary Duty of the Universities to assist in the Advancement of Learning and Science. ... We entirely concur with the impression thus conveyed to us by the evidence, and we are of opinion that the subject is one to which it is impossible to call attention too strongly.'[4]

'The Proposals to which we attach the utmost importance with a view to the Encouragement of Original Research at the Universities are ... (i) the Establishment of a complete Scientific Professoriate; (ii) the Appropriation, under certain conditions, of Fellowships to the Maintenance of Persons engaged in Original Research. But, in addition to these main proposals, other suggestions are contained in the evidence before us, to which we would call especial attention: (i) that Laboratories should be founded expressly intended for Research, and for the Training of Advanced Students in the methods of research; (ii) that Scientific Museums and Collections should be maintained to an extent beyond what is required for purely educational purposes; (iii) that a Doctorate in Science should be instituted.'[1]

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[1] Ibid.
[2] Ibid., Third Report p. ix.
[3] Ibid. p. xliv.
[4] Ibid. p.lvi.

Expanding on this last proposal, they suggested that this doctorate 'be conferred upon students, not in accordance with the results of an examination, but upon their giving proof of capacity for original research. The evidence of Dr Frankland and of Sir William Thomson,' they continued, 'appears to us conclusive upon the point that there is a real danger in the examination system; and in our opinion this danger might be guarded against by instituting a higher degree in science, the obtaining of which should be regarded as a great honour, and which should not be awarded except with reference to original work. The plan of requiring from a candidate for the Doctorate in Science a dissertation embodying an account of some original research of his own is strongly approved by such competent witnesses as Dr Siemens, Dr Carpenter and Professor Frankland.'[2]

And relating this directly to the University of London which already had such a degree, the Commissioners suggested that its Senate 'would do well to consider' awarding this 'only to those who have given proofs of the desire and the capacity to make some addition to Scientific Knowledge.'[3]

London responds with a thesis for its DSc

The DSc introduced by London in 1860 was granted purely on the basis of an examination in which the candidate was required to pass in a principal subject as well as one or more subsidiary cognate subjects. The Devonshire Commission's specific suggestion that a research element should be introduced into London's Doctorate of Science was welcomed by a considerable section of the governing body of the university. At its meeting of 14 May 1878, Convocation received a report from its Annual Committee which was that year devoted largely to the university's responsibility for expanding facilities for higher studies. After stressing the importance of the immediate postgraduate years as a time when 'the mind, disciplined by sound training and stored with acquired knowledge, is best able to enter upon special departments of pure science and to advance knowledge by mature study and independent research,' the committee suggested that the university could 'render essential service to the advancement of learning ... by admitting the importance of independent research for higher degrees.'

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[1] Ibid. p. lvii.

[2] Ibid. p. lix.

[3] Devonshire Commission (1871-1875) Seventh Report p. 3.

Convocation, having adopted this report, asked the Senate to give it full consideration and in March 1879, the registrar of the university, W.B. Carpenter,[1] sought the opinion of past and present examiners on the advisability of 'Independent Research' being recognized as a qualification for a Doctorate of Science. Later that year, his successor Arthur Milman (without having been specifically asked to do so) also discreetly sought information from some of the major German universities regarding their regulations for the PhD.

Forty replies were received from the examiners[2] and among the more outspoken was that of Ray Lankester, who was wholly in favour of the introduction of theses, adding that the number of candidates would go up if the grind of the examinations disappeared from the DSc, but he did not think that mattered. Tyndall, on the other hand, thought it would reduce the number of candidates, but did not think this mattered either![3]

Dr Pye Smith, writing from his address in Harley Street, strongly favoured the abolition of examinations for the DSc and also for the MD. Carey Foster, Todhunter from Cambridge and Sir Archibald Geikie, Professor of Geology at Edinburgh, were in favour of theses. Balfour Stuart from Owens, Manchester, made the point that he knew of 'graduates of the University of London who have now attained such a position as to render them unwilling to submit to examination but who would gladly be a candidate for the Doctorate if this were given ... to those only, who have advanced their branch of science in one way or other.' His colleague Roscoe, while foreseeing some difficulties in setting comparable standards for theses in subjects such as pure mathematics or philosophy as compared with experimental sciences, felt sure they could be overcome. In recommending that independent research should be made compulsory for the DSc he added: 'I believe that almost any plan which the Senate might feel it possible to carry out would be better than the present arrangements for practical examinations in Science in the DSc degree which I cannot help regarding as utterly worthless and even misleading.'

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[1] His evidence to the Devonshire Commission had in fact influenced them considerably towards recommending the adoption of independent research as part of a higher degree (see above).

[2] Views of Professors and Examiners on Research Work for the DSc, 1870s, Science 3, University of London Archives.

[3] In the event, there was no change. The average number of successful DScs remained at 5 per year in the 10 years following the new regulations, which was the same as it had been in the preceding 10 years. It was only at the end of the century that a definite upward trend became discernable.

Roscoe, who had been greatly in favour of the introduction of science degrees, clearly felt frustrated at the contradiction of having a doctorate which contained no element of research.

On the opposite side there was, among others, A.C. Ramsay, who argued that a Doctor was a teacher, a learned man and 'presumably qualified for the degree because of his knowledge of one or of several Sciences. Many very learned men, and many excellent Professors, are not remarkable for independent personal research in any particular branch of science', and they should not be deprived of the honour of the degree. However, where a candidate submitted independent work of high value, it should be marked with some kind of distinction to differentiate it from those who had taken it purely by examination.

In the event, the resulting report suggested that 'it would be unadvisable to abrogate at once the present system of written and practical Examinations, which were established on mature deliberation.' But 'Original Research or independent work, without being made compulsory, should be admitted as an alternative or optional qualification, and should be recognized as an important factor in estimating the claims of Candidates for the Doctorate.'[1]

The relevant addendum to the regulations for the DSc which finally appeared in the Calendar of 1881, permitted a 'Candidate for the Degree of Doctor of Science ... [to] transmit to the Registrar ... a printed Dissertation, Thesis, Memoir, or other work (whether written in view of his candidature, or previously published, or already accepted by one of the Learned Societies).' The examiners were instructed to allocate to such a piece of written work 'such proportionate value in reference to the whole Examination as they think fit,' accepting it 'in lieu of all or ... [some] of the Written or Practical examination in the subject therein dealt with. ...'

These new regulations had barely been published when it was recognized that they would not encourage candidates to engage in research, since there would be no assurance that by doing so they would be relieved of any part of the examination. A further inquiry as to the examiners' views in relation to a definite reduction in the scope of the examinations, elicited the following opinion from E. Ray Lankester:

'I am aware that Candidates for the Degree of DSc are now allowed and invited to put in proof of original work and research as part of their qualification for the Doctorate, but I am most strongly of the opinion that *no Candidate should be admitted* who does not do so; and further, I think that such original work, together with an Examination, *entirely limited to the elucidation of the subject-matter of the original work* sent in by the Candidate, should constitute the whole of the "exercise" required of the Candidate. ... The Degree of Doctor of Science of London might be made to play a most important part in the development of scientific work throughout the country, if it were given solely for excellence in original research' and it would attract graduates of other universities in the British Isles.[1]

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[1] University of London, Minutes of the Senate, 21 April 1880.

Similar sentiments were expressed by Lord Cavendish, Carey Foster, Sir Joseph Hooker, and Thiselton Dyer, among others, and finally Senate resolved to withdraw 'the existing syllabus for the DSc Examination' and to require 'any Bachelor of Science desiring to proceed to the Degree of Doctor of Science ... to submit an original Essay, Dissertation or Thesis as the foundation of his qualification for the Doctorate. ...'[2]

Accordingly the Calendar for 1885-6 announced the requisite new regulations which, with few alterations, continued into the early twentieth century: a genuine research degree that could be taken with no more than two years standing from the Bachelorship.

The genesis of London's DLit

Originally, in 1860, London's DSc had been instituted as the science equivalent of the Master of Arts. However, it soon became clear that a 'doctorate' was, after all, regarded as something more desirable than a mastership. A clamour therefore arose, for a doctorate now to be introduced on the arts side, and the Senate was asked 'to make provision for creating a Degree in Classics which shall rank with the Doctorate in other Faculties.'[3]

Accordingly, the registrar wrote to the Treasury, requesting an Opinion from the Law Officers of the Crown on whether the conferment of the degree of Doctor in Arts was consistent with the new Charter that had just been adopted. The Law Officers' 'Opinion', as transmitted to the University, is of considerable interest, in so far as it refers to historical practice which perhaps explains why — even to-day — no Doctorate in Arts is awarded at any university in the United Kingdom:

'With respect to the Degree of "Doctor in Arts",' ran the Opinion, 'we think that it cannot be conferred by the University, consistently with the terms of Clause 38 of the Charter. That Clause expressly provides the Degrees of Bachelor and Master shall be conferred in the Faculty of Arts; and according to the usage of all Universities with which we are acquainted (and which usage must, we think, be taken notice of in the construction of a Charter of this kind), the titles of "Doctor" and "Master" do not signify different steps or degrees in the same Faculty or department of knowledge, but signify similar or corresponding steps or degrees in different departments of knowledge; the terms "Doctor" being, in fact, the equivalent of "Master" though each term is (in practice) not used indifferently, but is appropriated to Faculties or departments of knowledge to which the other term is not applied. We cannot think that the present Charter authorizes any such innovation as the application of the terms "Doctor" and "Master" to designate distinct Degrees in one and the same Faculty or department of knowledge.'[1]

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[1] E. Ray Lankester to Arthur Milman, Registrar of the University of London, 20 October 1881 (printed). Letters in Reference to the syllabus of the Examinations for the degree of Doctor of Science, Science 4, University of London Archives.

[2] University of London, Minutes of the Senate, 28 January 1885.

[3] A resolution to this effect was passed by Convocation on 12 May 1863. See University of London, Minutes of the Senate, 15 June 1864.

However, it was clear that something had to be done to provide some kind of doctorate in the faculty of arts. As a certain report[2] pointed out, it was quite unjust for graduates in arts in the older universities to be able to supplicate for the degree of Doctor of Divinity and the degree of Doctor of Laws, when the University of London did not confer degrees in divinity and the degree of Doctor of Laws was awarded only to those with a profound knowledge of law!

The same report also warned that the arts faculty, so recently shorn of its science component, was in danger of losing students to science in other subjects too. For now that arts graduates in mathematics and philosophy could proceed to the title of DSc, they would naturally be tempted to switch to the science faculty on graduation, rather than take the MA.

Clearly some urgent action was required and it was ingeniously suggested that a Doctorate of Literature might be the answer. This seems to have satisfied the Law Officers, for the DLit made its first appearance in the Calendar of the University of London for the year 1868. Like the DSc at that time, it was to be taken entirely by examination, but in 1885 — the year in which the thesis became compulsory for the DSc — the DLit underwent an even greater revolution, because from that time onwards only Masters of Arts could present themselves as candidates, and since the MA in itself required higher examinations, candidates for the doctorate were now to be subjected only to a short examination closely related to the subject of their thesis. The regulations for the thesis which now became the chief and compulsory component of the degree were stringent, with a much lower pass rate than that for the DSc.[1]

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[1] University of London, Minutes of the Senate, 21 October 1863. By the same token, however, the subsequent introduction of the MSc and the more recent MPhil, would also appear to have been illogical.

[2] Report of the Committee on Examinations in Arts, Science and Laws, accepted by the Senate at its meeting of 15 June 1864.

By the late 1890s, the regulations for both DSc and DLit included a proviso that if the dissertation were of particular excellence, the candidate could, at the examiners' discretion, be exempted from any form of examination, even a viva voce.

And as London was laying a firm foundation for research degrees of high calibre, another growing movement of the late nineteenth century was to provide fertile student material as candidates for these new degrees. As Thomas Arnold had predicted in 1872: 'If Oxford refuses to be other than what our German friends truly call us, "a great Gymnasium", Faculties will be established before long in the great northern towns, and learning will migrate from the Isis to the Irwell or the Tyne.'[2]

The University Extension Movement was indeed remarkably successful, because it answered a great national as well as local need. With support from local industrialists as well as grants for scientific instruction from the Department of Science and Arts, and with the encouragement provided by the external degree system of London University, there took place a veritable mushrooming of provincial university colleges. During the 1870s, Newcastle, Sheffield, Leeds, Bristol and Birmingham were all to see the development of such institutions, while Nottingham, Exeter and Reading followed during the next twelve years. None of these were to achieve full university status until the early twentieth century; meanwhile they trained their students for London degrees, but like their predecessor at Manchester, some of these university colleges certainly played their part in providing facilities for research. And indeed, from the beginning, many German-trained scientists carried out important research in these new institutions,[3] whilst a group of Manchester-trained men later contributed to their continued scientific reputation.[4]

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[1] In the 17 years under the old regulations (1868-1885), only three DLits were awarded. In the following 13 years the number rose to 7 and in fact this total of 10 DLits represented a pass rate of approximately 25% since 38 students had registered for the degree during this period of 30 years. The corresponding figures for the DSc were very much higher, 147 out of 298 candidates being awarded the degree in the period 1862-1898. On the other hand, arts students could take the MA which was passed by 681 out of 1,011 candidates between 1840 and 1898. There was no comparable intermediate degree for science students until the MSc made its debut in 1914.

[2] Arnold, T. (1872) p. 28.

[3] See Armytage (1965a) pp. 166-167.

[4] By the turn of the century, 6 out of 13 chairs of chemistry at universities and university colleges in Britain were held by former Manchester students (see Hartog 1900 p. 70).

In 1880, Manchester itself — largely due to its lively and forward-looking professoriate engaged in diverse research activities[1] — achieved University status on a federal basis to be joined by Liverpool in 1884 and Leeds in 1887. This in turn no doubt spurred on the campaign which finally succeeded in turning London into a genuine teaching university, thus laying a basis for the proper organization of postgraduate research in the metropolis.

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[1] By this time Roscoe had brought over Carl Schorlemmer from Germany to fill a second chair in chemistry at Manchester and, for the first time ever, a British institution was actually supporting two professors in a single science subject.

SIGNS OF BREAK-THROUGH IN OLDER UNIVERSITIES — THEIR EARLY RESEARCH DEGREES

The first research degrees at Oxford

These various developments in London and elsewhere could not but aid the efforts of those who continued to campaign for increased research opportunities at Oxford. Gone were the voices of Pattison and Arnold — only to be replaced by those of Bryce and Gardner, Poulton and Ball and Firth, and many more who believed that academic progress lay in the *revitalization* of the *University*. Once again it was the crucial need to expand the function of that larger corporate body against the self-perpetuating interests of the ever powerful colleges which divided the 'researchers' — who were beginning to think in terms of new degrees to reward and encourage mature study — from the 'educationists' who fought against the obliteration of traditional liberal education which would surely result from the introduction of these Germanized degrees that might even (heaven forbid) be made available to graduates from other universities.

These movements and counter-movements were not always clearly defined, but one particularly influential body certainly acted as an organized pressure group when the battle for research degrees began to gather momentum.

On 10 February 1889, a meeting was held at Exeter College to form a new organization called the 'Club',[1] whose general aim was the furtherance of 'the University as a home of learning and science' and therefore in matters of 'university politics, 1) to take the professorial as distinct from the tutorial and the University as opposed to the College point of view on education, 2) to have the examination system kept within limits rather than extended, 3) to have the Bodleian library managed as a place of study and research for mature students, 4) to act on academical, not on purely political grounds for voting for Council, etc.'[2]

Amongst the Club's membership were to be found the names of Pelham, Nettleship, Napier, York Powell, Mowatt, Arthur Evans, Warde Fowler and Ray Lankester. James Bryce and Percy Gardner were also active members, while Sidney Ball, who was eventually to play a key role in Oxford's adoption of the PhD, was for many years its enthusiastic and devoted secretary.[1]

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[1] Not to be confused with that other Club, known as '*The* Club', a dining and wining society dating back to the 1820s (see Oman 1941 p. 199).

[2] Notice of a Meeting ... (1889).

Pitted against the Club and its activities in support of a more effective university, was the Non-Placet Society, of which Thomas Case, President of Corpus Christi, and Dr James Bellamy, President of St Johns, and the historian Charles Oman were leading members. This had been formed some years before, in 1886, 'to criticise modern innovations,' to defend Oxford against the acceptance of grants from the state, to oppose the proliferation of Honours Schools and in particular the setting up of a Modern Languages School 'favoured by the ladies and the Greekless', and to resist the creation of new research degrees.[2]

No doubt the formation of this Society had been precipitated by the Hebdomadal Council's adoption that same year of a report containing proposed statutes for new higher degrees of DLitt and DSc. This resulted in much agitated discussion throughout the university in the months leading up to their consideration by Congregation. Thus for example the statement issued by the Oxford historian Edward Freeman.

Writing from his winter quarters in Palermo, early in 1887, Freeman urged his colleagues to question the wisdom of these ill-considered innovations: 'We are asked to make "Doctors of Letters" but no definition of "Letters" is given us ... we have no faculty of "Letters".' While the term natural science is not so vague, it must be remembered that in fact there are no professions either of science or of letters, yet we are accustomed to our doctorates leading to professions. 'Nor is it proposed to create Bachelors of either Letters or Natural Science but our doctorates of Law, Medicine and Divinity have always been preceded by baccalaureates."[3]

And then again, Freeman, who was by no means consistently conservative, was highly suspicious of this strange type of qualification which was neither to be acquired by passing examinations nor to be awarded as an honour: 'Really eminent men, men who have made real contributions to learning, men who would confer honour on the degree, will stand aloof, and leave the new degree to quite another class. Hard as it is to believe it, there does seem to be a class of people who like to be called "Doctor". ..."[3]

On the other hand, an editorial note in the *Oxford Magazine*[4] showed concern at a loophole in the proposed statutes that would lead to the new degrees being conferred automatically 'in certain cases'. Might they go to Heads of Houses looking for 'a properly coloured gown ... to wear on great occasions?' or perhaps 'pass coaches' wanting 'brass plates on their doors?' Or sons of Oxford who were 'eminent in their branch of learning but find themselves beaten in the race for fame by Doctors of Cambridge[1] and meaner Universities?' If, however, the new doctorate was to be restricted to being a purely earned one, it was equally distasteful to contemplate an Oxford worthy having to go through the humiliating process of applying for permission, submitting himself to votes, being reported upon and, even worse, possibly being refused the degree at the end of all this tiresome and embarrassing procedure.[2]

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[1] See below, p. 139.

[2] See Oman (1941) p. 239. The menu at the Society's first annual dinner is said to have included such delectable dishes as 'Devilled Professors on Toast' and 'Langues modernes sautées' (*Oxford Magazine* 7 December 1887).

[3] Freeman (1887).

[4] D. (L and S) ... (1887).

With all this ambivalence, not surprisingly, Congregation rejected the proposed statutes,[3] but the Hebdomadal Council reconstituted its 'Committee on the New Doctor's Degree' and four years later[4] it once again recommended the introduction of the new doctorates. On this occasion the *Oxford Magazine*[5] carried an anonymous article making a very clear and concise case in favour.

That doctorates were available only to the small number of students in the three superior faculties, argued the *Oxford Magazine*, was an anomaly which dated back to the Middle Ages. 'As long as the University was mainly composed of clerics, with a sprinkling of lawyers ... and a small infusion of physicians, no one could reasonably grumble at the arrangement.'

Now, however, the arts faculty had become an end in itself and its members, in numbers and academic importance, far exceeded those belonging to any other faculty. At the same time, the statutes for the degree of Doctor of Civil Law (DCL) had recently been altered to include the requirement of a thesis and the Bachelor of Civil Law (BCL) too, involved a rigorous examination. Nor was the DD now being distributed as indiscriminately as in the past.

'We are thus presented with the spectacle of three purely professional doctorates, which exclude five sevenths of the teaching staff of the University from their pale. In status and precedence the most distinguished Master of Arts must take a seat below the humblest fourth-class man who has scraped through the B.C.L. examination and written a thesis just good enough to justify the Law Faculty in passing him for a doctorate.'

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[1] Cambridge had been awarding the DSc and DLitt since 1883.

[2] One is reminded here of the predicament of the four professors of science of Queen's College, Liverpool, who unsuccessfully petitioned the Chancellor and Senate of the University of London to be granted the newly introduced doctorate of science honorarily, because they felt it below their dignity to have to present themselves for the new degree alongside their own students. The original of this memorial, in the archives of the University of London, is undated, but approximately 1860 (Memorials, 1840s-1850s, Science I).

[3] 1 February 1887.

[4] At its meeting of 17 November 1891.

[5] The degree of Doctor of Letters (1891).

Having stated the case for new doctorates in the arts faculty, the writer warned against conferrring these honorarily: 'This we think, would be most disasterous ... of the men deserving a Doctor's degree very few have not written something already; and those few who have not, may as well begin at once: perhaps the stimulus of a Doctorate may cure the diffidence or indolence which has hitherto kept them from using the pen. If there chance to be Heads of Houses and Professors who have never written a word, and never intend to do so, such silent brethren must be content to sign their names without subscribing at the end the mystic letters Litt. Doc.'

In the event, the proposal once again failed to be adopted but by February 1894 yet another Committee on Degrees for Research had been set up. Rather than deliberate on the desirability of introducing new doctorates, this new committee was asked to give consideration to a Memorial requesting that 'the degree of B.A. might be granted without examination to students who have carried on research in Oxford, and whose work has been duly tested and approved.' The prime mover of this memorial had been Professor Poulton, recently appointed to the Chair of Zoology.[2] Poulton was doubly motivated in that he not only believed in the importance of rewarding the efforts of research students, but he was also a strong opponent of the existing examination system, which in his view strangled all initiative, imagination and originality. He was therefore endeavouring not only to encourage students to engage in research, but also to create a means by which at least some of them could be spared the stultifying experience of the fact-cramming and memory-stretching demanded by the current examination system for the Honours schools.

The Committee called upon the signatories of the Memorial to give evidence before it, and its report indicates that — apart from Poulton — Arthur Evans, Professors Sanday, Napier and Gardner, Michael Sadler and Sir Arthur Rücker presented their views.[3]

It soon became clear that some of the memorialists were prepared to move far beyond their original proposal of a new (research) avenue to the BA degree. Thus for example, Professor Napier suggested that 'if students are to be drawn from America and the Continent, the title of Doctor would be desirable, as he did not believe that the ordinary B.A.

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[1] The degree of Doctor of Letters (1891).

[2] Referring to this episode later, he revealed that the idea had grown out of a conversation in the first half of 1893, between Sir William Thiselton-Dyer, Ray Lankester and himself (see Poulton 1917).

[3] See Report of the Committee on Degrees for Research, 10 February 1894 (HC/M/3/14, University of Oxford Archives).

degree would attract them.'[1]

This sentiment was echoed by Michael Sadler, recently returned from a fact-finding tour of American educational institutions, who believed that many American graduates now going to Germany would be glad to come to Oxford if they could obtain similar academic recognition there. Poulton himself, while arguing strongly for a first degree by research as a means of by-passing examinations, was certainly not averse to the idea of a doctorate as a higher research degree.

In the event, the Committee, which included a number of 'researchers' among its members, proposed the institution of the degrees of BSc and BLitt to carry the same general status as the BCL and the BM. It also recommended that holders of these new Bachelors degrees who had completed a sufficient number of terms of standing should be permitted to supplicate for the MA.

The discussion on the report continued throughout that summer, with many now accustomed arguments being raised once again. But Poulton, while pleading for unity amongst the researchers, also tried to allay the opposition's fears that, with the adoption of research degrees, the whole German system would engulf the university and the examination schools would sink into oblivion. He assured them that the new degree would only be offered to those who had already graduated, adding that it 'cannot be too strongly insisted that there is no intention to interfere with the class of men who now make use of our examination system.'[2]

Poulton realized that given the current mood of Congregation he would do well to contain his strong views against examinations[3] and to forego his original proposal of a new research route to the BA. His diplomacy in this matter no doubt contributed greatly to the speed with which legislation for the new research degrees was finally enacted.

In November 1894, Congregation agreed to the introduction of the new research degrees of BSc and BLitt; discussion on the all-important question of 'residence' for the new degrees was adjourned until the new year. Among those who argued for a shorter term of residence than was customary for Bachelors degrees at Oxford was Joseph Wells of Wadham: 'We profess to be anxious to attract the foreign student, especially the American student here: yet we certainly shall fail to do so if we exact in all cases a period of residence twice as long as that required in Germany for the PhD. This degree is taken by scores of American Graduates every year ... and I fear it is most unlikely that they will seek a new degree of unknown value, at the cost of twice as much time as is required for a degree, the value of which is universally recognised.'[1]

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[1] Ibid.

[2] Poulton (1894).

[3] For these, see Poulton (1908) pp. 197-199.

Thomas Case, that shrewd and vociferous university politician on the conservative side, also saw the need to reduce residence for the new degree, but he was determined to preserve the sanctity of the three years' residence qualification for membership of the university. He therefore issued a statement to the effect that to offer the new research students 'Degrees in Research and refuse to reduce their residence would be to give with one hand and take away with the other; or when a man asks for bread to give him a stone — for "twelve terms of residence" would be a very stone to the "student"; and to sugar it with M.A. would not enable him to digest it. In sober earnest, reduction of residence is more necessary than the Degree of Master of Arts. Moreover, even if the plan of refusing to reduce residence, but allowing the M.A., succeeded for the moment, the projectors of the Statute, who have shewn their hands in their Amendments, will never rest hereafter till they have also secured the necessary reduction of residence by an agitation, sure to succeed in the long run, because it would be just ... we know that sooner or later the projectors of the Statute are bent on the further privileges of reduced residence, and a Doctorate in Letters and Science.[2] Let us be wise in time, and before the University has emptied its whole Cornucopia on Research, give "students" the privileges necessary to graduates of other Universities ... of reduced residence, ... an Honour Degree in Letters or Science, — but not an Honour Degree of Master of Arts."[3]

Case and his followers won the day. While the original proposal of three years' residence for the new degrees was amended to two for approved British, colonial and American students and reduced to only one year for Oxford BAs, the Bachelor of Science or Letters per se was not entitled to proceed to the MA and membership of the university.

Two principles had now been established, whose significance for the future of the university equalled that of any other piece of nineteenth-century legislatory reform. On the one hand it marked the first real victory in the long campaign for recognition of the advancement of knowledge and training in research as essential functions and responsibilities of Britain's oldest university. For despite the obvious inadequacies of the new research baccalaureates and the severe criticisms that were heaped upon them during the decades that followed — at last the monopoly of 'liberal education' as Oxford's raison d'être had been broken. The piecemeal reforms of the past four decades had opened the way to formal recognition of study and research beyond the venerated Bachelor of Arts degree and the first serious steps had been taken to develop Oxford as a seat of *higher* learning.

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[1] Wells (1895). Wells was later to become Warden of Wadham (1913-27) and a member of the Hebdomadal Council.

[2] The prophetic nature of the last part of this statement was soon borne out (see below, p. 59).

[3] Case (1895).

The other highly significant aspect of the new legislation was that graduates of other universities were now to be permitted to study at Oxford for degrees other than the Bachelor of Arts. True, these were still to be Bachelors degrees, but unlike candidates for the existing (professional) Bachelors degrees of medicine, divinity and civil law — those for the new BSc and BLitt were not required to be Oxford Bachelors of Arts.[1]

The establishment of the new degrees, involving a new type of study outside the traditional sphere of the Schools, necessarily led to a reconsideration of the traditional methods of control and administration. Decisions relating to research and specialized study could not be left to the customary 'delagacy' consisting of an assortment of university politicians. They clearly had to be made by specialists in the appropriate academic fields. And so during February 1895, when the statutes and the proposed machinery for operating the new degrees came before Congregation, it was decided to set up a new type of committee consisting of eight persons elected by the faculty boards. This would be responsible for the general admission of candidates, whilst the supervision of the student and his supplication for degrees was put directly into the hands of the respective faculty boards.

This strengthening of the powers of the faculties was highly significant, for it was their former weakness which had been largely responsible for the demise of the higher degree in law, medicine and divinity and for the lack of development of postgraduate education in arts and science. On the governing bodies of the German universities, the faculties were represented by their deans; in the modern French universities, the governing councils were totally dependent on the faculties, being made up of their deans and two professors from each, elected directly by their respective members.

At Oxford, faculty organization had been almost non-existent since the Middle Ages and only in the early 1870s had some new beginning been made with the setting up of ten boards of studies, to supervise examinations. Then, in 1882, as a result of the deliberations of the 1877 Commissioners, a statute was introduced which converted these into boards of faculties with additional powers of devising lecture lists and taking a wider interest in all academic matters relating to their particular discipline. Now with this latest expansion of their functions to include the supervision of the new research degrees, their potential importance in the development of postgraduate work was recognized and the Hebdomadal Council began to consult them on other academic matters.

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[1] In 1900 this requirement was abolished for the BCL and it too was then available to graduates from other universities (see below, pp. 60-1).

The main task of the new faculty-based 'Education Committee' was to judge the adequacy of the 'general education' of applicants for admission to the new Bachelors degrees.[1] Before long it drew up a list of colleges and universities whose Bachelors degrees it considered to be sufficient qualification for admission as advanced students. This list included all affiliated and privileged institutions[2] as well as a number of others. The German PhD for this purpose counted as a Bachelor of Arts! If the applicant for admission was a graduate of a university whose name did not appear on the list, or if he had no degree at all, his case had to be considered individually.

Over the years, names were added to this list of acceptable institutions and occasionally they were struck off. Thus it included Harvard, Yale, Columbia, Johns Hopkins, Cornell and Princeton almost from the beginning, but California was added in 1899 and Pennsylvania in 1903. On the other hand, in November 1902, the Committee decided to delete the first category of institutions on its list which had read simply: 'The Universities of the United Kingdom'. Instead it now spelt out individually Cambridge, Durham, Victoria, Birmingham and Trinity College Dublin; two months later — almost as an afterthought — London, Scotland and Wales were added to the list.

The Minutes of the Education Committee do not tell us whether this sudden fear of blanket admission of graduates of all British Universities was caused by the rapid mushrooming of new institutions at this time. Certainly its members were highly conscious of their mission — to guard the standards of the new degrees in the name of the ancient university. It was therefore also in keeping that, on 3 February 1910, they should have removed Glasgow, Aberdeen and Edinburgh from the automatic acceptance list, since Latin had ceased to be a compulsory subject for graduates in arts at those universities.

The inscription of the new research degrees of BSc and BLitt on the Statute Book in 1895, resulted in the almost immediate resumption of moves to introduce doctorates in letters and science. The mood had certainly changed since their first rejection in 1887. Apart from other considerations, the very existence of bachelorships in these fields now meant that doctorates could fit in neatly alongside those in other professional faculties. In November 1895 the Hebdomadal Council recommended their institution and by March 1896 the boards of faculties had, in general, given their assent. Towards the end of 1898, draft statutes for the new degrees came before the Hebdomadal Council and apart from such questions of detail as the place of precedence of the new doctors, who was to present them, and the colour of their robes, discussion on this occasion appears to have centred mainly around such issues as whether a new faculty of letters and of science should be created and whether doctors should become members of the university, even if they had acquired this status on the basis of a BSc or BLitt rather than the BA.

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[1] The regulations required candidates to be 21 years of age or over, and to 'give evidence of having received a good general education'.

[2] See below, pp. 74-5.

Another familiar point was raised specifically by Strachan-Davidson of Balliol, when he pleaded that 'Heads of Houses and Professors should be allowed without submitting any exercises, to supplicate' for one or other of these degrees. As a member of the board of the faculty of arts (Literae Humaniores), he was keenly conscious that the burden of the embarrassment of having to judge the worthiness of their publications would fall most heavily on himself and his colleagues.[1] But to those who envisaged the purpose of the new degrees as a meaningful recognition of work of a very high standard, Strachan-Davidson's proposal represented a serious threat, and it was rejected by a forceful majority.[2] On the other hand, the efforts of those reformers who wished to see doctors per se becoming members of the university were similarly unsuccessful.

The doctorates of science and of letters which were introduced in 1900 became accessible to Oxford Bachelors of Science and of Letters of eighteen terms standing and to MAs of thirty-nine terms from matriculation.[3] To qualify, candidates had to submit copies of papers or books containing an original contribution to the Advancement of Learning and Science.

Discussion had also been proceeding on the advisability of making the degree of BCL available to non-Oxford graduates and once again — as in the case of the new research Bachelors degrees — it was argued that American students were not studying law at Oxford because to obtain the degree they had first to study for the Oxford BA. Professor Dicey who produced a Memorandum[4] on this question argued as follows.

Hundreds of graduates who had taken the BA in the universities of the United States and the Colonies with a view to practising law in their own country, wished to prosecute or complete their legal studies in a European and preferably English university. The antiquity, the prestige and the charm of Oxford had an attraction for American citizens and its BCL leading to the DCL had a very high reputation, entailing severe examination[1] in English as well as Roman law — both of which were important to American and Colonial students. Yet Dicey did not know of a single American BA who had ever taken the BCL. The reasons were not too far to seek. Could a Harvard BA, he asked, with perhaps a year or two of postgraduate experience, be imagined to want to go through the whole undergraduate course for an Oxford BA and then a further two years for the BCL?

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[1] Strachan-Davidson (1900). Strachan-Davidson became Master of Balliol in 1907. He does not appear himself to have ever attained an Oxford doctorate, although ironically he received an honourary LLD from Glasgow and from St Andrews.

[2] According to G.B. Grundy, who in 1902 was one of the first to obtain the degree of DLitt, the opposition to the new degrees was largely confined 'to senior members of the University who had never done any original work in their subjects, and were too old to have much hope of doing it for this degree' (Grundy 1945 p. 95).

[3] Theoretically there were four terms in each academic year.

[4] On the Advisability of Admitting to the Degree of BCL persons who have obtained the Degree of BA at certain Colonial and American Universities, 10 February 1899 (HC/M/3/17 University of Oxford Archives).

On the other hand, if Oxford's professional degrees were opened to overseas graduates, these would in fact provide the main body of students, without whom it would hardly be worth Oxford's while to develop a system of postgraduate study. Thus he wrote to his friend James Bryce at this time: 'If it [his scheme for admitting non-Oxford graduates to the BCL] should in any manner succeed and we could collect here even a very small body of men, say from 10 to 20 who would reside and read for the BCL degree, it would, I believe, be possible to lay the foundations, at any rate, of postgraduate study and improve the whole school.'[2] Dicey's scheme was adopted and his hopes were certainly fulfilled in that American and colonial students were soon making good use of these new opportunities.[3]

The Cambridge ScD and LittD

The work of the Cambridge Statutory Commissioners arising out of the Oxford and Cambridge Act of 1877 had led more directly to the introduction of research degrees than that of their Oxford counterparts. Quite early on in their proceedings they sent out a letter of inquiry to large numbers of heads of houses, professors, university officers, members of the Council, tutors and bursars of colleges and others to elicit their views on the principal needs of the university and the methods by which their fulfilment should be financed. A considerable number of respondents cited the expansion of graduate education as a major need.

The Reverend Hort, Fellow of Emmanuel, believed that if 'the education of graduates' were 'treated as a matter of primary concern to the University and Colleges, the whole work of the place' would be 'continuous and coherent; teaching and ultimately research being naturally employments of advanced students. ...'[1] Hort, who was to play an active role in the furtherance of graduate education at Cambridge, clearly saw it as a natural training for future teachers and research workers.

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[1] During the three academic years 1909-12, only 28 out of 67 candidates passed it (see Parkin 1913 f.n. p. 171).

[2] A.V. Dicey to James Bryce, letter dated 18 May 1899 (M/S Bryce 2 Fol 283 p. 10, Dept. of Western MSS, Bodleian Library, Oxford).

[3] Out of 28 who gained the BCL during the three academic years 1909-12, 13 had been Rhodes Scholars (see Parkin 1913 f.n. p. 171).

Michael Foster, then Praelector in Physiology at Trinity College, echoed these sentiments when he strongly recommended provision for what he called 'a noviciate of learning'. Referring to his colleague Coutts Trotter's recent pamphlet on university reform,[2] he suggested that 'studentships should be instituted, which might be held by men immediately upon taking their degree, and which would enable them to devote themselves, free from care, to the advancement of learning. To these studentships I would attach no conditions whatever, save that they should not be held for more than two, or at the most three years.'[3]

Ray Lankester, at that time Professor of Zoology at University College, London, submitted a comprehensive scheme for the reorganization of the University of Cambridge, which included the introduction of a doctorate 'open to candidates who have been bachelors for two years; such a Doctor's degree to be awarded in consideration of an approved thesis, containing the results of original investigation.'[4] Lankester was at this time also successfully pressing for London's DSc to become a research degree.

The introduction of the new doctorate at Cambridge caused surprisingly little controversy. The first move in this direction emanated from the Council of the Senate as early as 19 May 1879, when it asked the Commissioners to introduce a statute to empower Cambridge to confer the degrees of BSc, MSc and DSc. In support of this request, the Council argued that 'the sphere of Science studies is ever extending itself, and distinctions in its various branches seem to require some special recognition, for which the titles of other degrees are scarcely appropriate. Degrees in Science are already conferred by the Universities of London and Edinburgh.'[5]

The Commissioners reacted favourably and among the fifteen new statutes they finally devised was one enabling the university to make regulations for graduates who 'have given proofs of distinction in Science by some original contribution to the advancement of Science' to be created 'Doctors of Science'. They did not take up the question of Bachelors or Masters of Science, nor did the Council persist in this part of their request. However, on the proposition of Dr Hort, at a meeting on 19 February 1880, they agreed by ten votes to three to ask the Commissioners to empower 'the University by similar statute to admit to the Degree of Doctor of Literature.' This being approved, new statutes providing for a doctorate of science and a doctorate of letters came into force in 1882.

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[1] Cambridge University Statutory Commissioners (1877) p. 73.

[2] A fellow Trinity reformer, who had suggested a 'system of "Senior Scholarships" to be held by young graduates of promise on conditions of systematic study of an advanced and special kind, such as would be naturally combined with early attempts at original work' (Trotter 1877 p. 14).

[3] Cambridge University Statutory Commissioners (1877) p. 59.

[4] Ibid. p. 89.

[5] Cambridge, University of (1879).

A syndicate was appointed to frame the necessary regulations and the only problem that caused some discussion was that of distinguishing between letters and science in borderline cases. The regulations that were finally approved permitted any Master of Arts, Law or Surgery of not less than five years' standing and any Bachelor of Medicine of not less than seven years' standing to become a candidate for the new doctorates. And already there was a small 'queue' of mature graduates waiting to submit their original researches to obtain the new degree. The first two Doctors of Science were created as early as 31 May 1883. The following month, Percy Gardner, who was later to play such an important role in the development of postgraduate studies at Oxford, was created the first Cambridge Doctor of Letters.

The Cambridge BA by research

During their first ten years, twenty-four ScDs and twenty-one LittDs were awarded, amongst others to J.N. Keynes, M.J.M. Hill, Henry Sidgwick and J.H. Poynting. These were all Cambridge Bachelors, since as yet no provision had been made for graduates of other universities to obtain a Cambridge degree by advanced study or research.

Such provision was first considered by the Senate when it had before it a 'Report on Postgraduate Study' dated 5 February 1894, which recommended the institution of degrees of BLitt and BSc. They were to be open to graduates of other 'recognized' universities who had pursued a course of advanced study or research during a minimum period of three terms of residence and had presented an original dissertation. The new degrees were not to lead to a mastership or doctorate, which were still to remain the prerogative of Cambridge Bachelors of Arts. But it was proposed that the latter be permitted to supplicate for the new research bachelorships.

During the Senate's discussion on this,[1] the question arose, as it had done at Oxford, whether graduates from other universities would be attracted by the offer of another bachelorship. Another question, the inclusion of women in the new scheme, was quickly set aside when it was pointed out that to produce such a 'red herring' at this juncture might jeopardize the whole proposal.

Professor Marshall, the economist, wondered whether it would be better to make the present doctorates available within a shorter period rather than to institute a new degree to be conferred after one year. Mr Bateson, a strong opponent of the whole scheme, thought that it would only attract second-rate students. First-rate students would come anyway because of the excellence of the teachers and not for the degree. He also warned that Cambridge would have fewer English, Scottish and colonial graduates at any one time, because those who up to this time had come for the three year BA would now choose the new one-year Bachelors degrees. Both Professors Sidgwick and J.J. Thomson felt quite sure that such a deficit would be more than made up for by the large influx of those who would never have considered coming under the old scheme at all.

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[1] Cambridge, University of (1894a).

The argument that there would not be sufficient demand from genuinely able students and that only degree-hunters would be attracted by the new scheme, was firmly refuted by J.J. Thomson whose experience at the Cavendish showed that there was a considerable demand, not from degree-hunters, but from men who had a right to expect a qualification. Alfred Dale, then a college tutor (later to become vice-chancellor of Liverpool), also confirmed that he had a regular flow of applicants for advanced work. The provision of facilities for postgraduate study had come to be recognized as part of the function of a university and 'it was ignominious to be obliged to reply when enquiries were made, that Cambridge had no degrees and no organized system for such students.'[1]

While Cambridge was still deliberating on these questions, Oxford was already in the process of introducing its new research bachelorships open to graduates of foreign universities and the Scottish universities were putting forward similar schemes. The Council of the Senate therefore recommended that a syndicate be set up to reconsider the whole issue of research degrees in the light of the proposals being made by those universities.[2]

Moreover, at this particular time, the Secretary of State for the Colonies passed on to the Universities of Oxford and Cambridge a request from the Minister of Education of Ontario that they should facilitate the entry of Canadian graduates to postgraduate study in England. What in effect he was asking was that Oxford and Cambridge should recognize the Canadian Bachelors degree as sufficient proof of maturity to embark on postgraduate studies — rather than insist on Canadian graduates having to submit themselves first to three years of study for the BA. Referring to the ease with which the German universities admitted Canadian graduates to their courses, he felt sure that if this 'were pointed out to the authorities at Oxford and Cambridge they would relax a regulation which is vexatious to the Canadian students and which places them in foreign associations which are certainly not as desirable in many respects as the associations of the British University.'[3]

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[1] Ibid. p. 496.

[2] See Cambridge, University of (1894b).

[3] Ibid. p. 86.

It was a timely request, to be repeated on future occasions, by which time, however, the proliferation of American graduate schools caused Canadian pleas to centre around fears of the Americanization rather than the Germanization of their graduates.

The Syndicate on Research Degrees set up by the Senate included among its members the most vociferous opponents as well as supporters of research bachelorships. And perhaps this explains why the proposals with which they finally emerged were accepted with little emendation.

While it felt that Cambridge Bachelors might well go forward to a research qualification without further courses, graduates from most other universities would require instruction and certainly residence, expecially if the bachelorship were to lead to a Cambridge MA. In order to satisfy these various needs, the Syndicate recommended the creation of a status of 'advanced student' for graduates of twenty years of age and over (exceptionally, non-graduates would be considered). Such an advanced student could opt for one of three alternatives: he could reside for three terms and submit an original dissertation which, if accepted, would gain him a Certificate of Research. He could then reside for a further three terms and proceed (without further examination) to the BA. Or, if he wished, he could sit the tripos after three terms and then spend three terms producing a dissertation which, if successful, would gain him a Certificate of Research as well as a BA. Or, finally, he could spend six terms working for the tripos examination and obtain a BA degree.[1] In all three cases, the BA would lead to the MA in the normal way.

In short, six terms' residence could bring a Cambridge BA degree by examination or dissertation or both, and Cambridge went further than Oxford, for it now offered membership of the university to a class of Bachelors with reduced residence as well as to some who had not taken a single examination at the university.

In retrospect, it is interesting to note that of the 102 students who were admitted to 'advanced' status during the first five years of its existence, only thirty-four proceeded to the degree of BA by any of these methods. A report of the Council of the Senate attributed this statistic to what it regarded as proof of a healthy disinterest on the part of these students in obtaining the degree, and it concluded that on the whole they came to Cambridge simply for study and research as such.[2] It might of course have been argued conversely, that the great majority of these students already had BAs and therefore had little interest in adding another one to their collection. Moreover, the fact that out of sixty-seven students admitted to 'courses of research' less than half obtained a Certificate of Research raises the question of how many despaired of the lack of *postgraduate instruction* at Cambridge and moved on to the Continent. For while the term 'course of research' existed on paper, in practice, Cambridge like Oxford had no such courses. Potentially she possessed some splendid facilities for advanced students, but although the Cavendish was flourishing, it was grossly overcrowded, and while priceless gifts and collections of books were arriving at the University Library, more often than not they caused acute embarrassment for lack of space in which to store them and, even worse, lack of finances to catalogue them.

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[1] There was nothing new in this final alternative, for since 1866 Cambridge had been offering a remission of 3 terms' residence for their BA by tripos to students who had already spent a minimum of two years studying at 'Affiliated Colleges' in the United Kingdom or the British Empire.

[2] University of Cambridge, Report of the Council of the Senate to the Senate, dated 3 June 1901.

Nevertheless, that magic year of 1895, which produced the Oxford BLitt and BSc was also momentous for Cambridge. In the words of J.J. Thomson, 'the year 1895 is one of the most important years in the history of the Cavendish Laboratory, for then a regulation came into force by which graduates of other universities were admitted to Cambridge as "Research Students".[1] ... This policy ... had a very auspicious start, for at the beginning of October 1895, when the regulations first came into force, Ernest Rutherford, now Lord Rutherford, O.M., F.R.S., and J.S.E. Townsend, now F.R.S. and Wykeham Professor of Physics at Oxford, came to the Laboratory to enter as research students within about an hour of each other.'[2]

Cambridge then, like Oxford, at the turn of the century had both doctorates in science and letters and Bachelors degrees awarded for dissertations; it had acquired some excellent facilities for research whose development was desperately cramped by lack of funds; and while certain individual teachers gave a great deal of their time and experience to a few outstanding students, there was nothing that could as yet be even remotely described as *systematic instruction* for graduate students.

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[1] J. J.'s memory is somewhat confused here, for this term was in fact only introduced in 1913, when it was decided that 'advanced' students were no longer to be admitted to the two-year BA by tripos. This meant that they were to be restricted to research activities only, and it seemed more appropriate to rename them 'research' students.

[2] Thomson (1936) pp. 136-137. Rutherford, a New Zealander, after being awarded an 1851 scholarship, had applied for a place in Thomson's laboratory and received the following reply: 'I shall be very glad for you to work at the Cavendish Laboratory and will give you all the assistance I can. Though it is not absolutely necessary, I think you will find it advantageous to become a member of the University. We have instituted a degree for research so that anyone who resides for two years and does an original investigation, which receives the approval of the examiners, receives a degree; if he resides for one year and does the investigation he is given a diploma. If you could spare the time to come to Cambridge for a few hours, I should be glad to talk matters over with you...' (letter from J.J. Thomson to Ernest Rutherford, dated 24 September 1895, in Eve (1939) p. 13).

The Scottish doctorates of the 1860s and 1890s

Whilst the development of postgraduate studies in Scotland had naturally differed from that at Oxford and Cambridge, that extraordinary year of 1895 also proved to be momentous there, for it was then that all her four universities adopted the DSc, DLitt and DPhil, as five-year research degrees open to graduates of other universities.

These degrees had their origins in the controversies raging in the Scottish universities of the 1850s — between those who wished to see them developing along continental lines, independently of England, and those who saw the path ahead as that of a reformed Oxford or Cambridge. James Lorimer and his 'Association for the Extension of the Scottish Universities', which included Sir David Brewster (champion of the claims of science and co-founder of the British Association twenty years before), advocated an organized scheme of specialized research for students who at nineteen or twenty years of age had completed a good solid general education with a first degree. Their object was to turn the Scottish universities into centres for the formation of a class of learned men, which would place them on an equal footing with the universities of other countries where the professorial system prevailed. This implied the creation of an advanced professorial system and also raised the question of state aid.

Such a Germanic concept was bitterly opposed by the Anglophiles, whose chief protagonist was classicist J.C. Shairp. While recognizing the need for university reform, they believed in much classics and some mathematics, a strict text book regime, a tutorial rather than a professorial system and a postponement of any thought of advanced studies to a time when Scotland might be able to afford such luxuries — in the far distant future.[1]

The Scottish University Reform Act of 1858 bore the marks of both these movements, and shook the existing academic foundations to their roots by a thorough reorganization of the curricula and conditions of graduation. Before long, further reforms were being considered at Edinburgh, where Brewster had meanwhile become principal. His hand was clearly visible in that university's decision in 1864 to institute a qualification beyond the MA[1] — the doctorate of science. Unlike the London DSc which had preceded it by four years, the new Edinburgh degree contained an element of research from the beginning.

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[1] See Lorimer (1854) and Shairp (1856). For a full account of the interaction of these movements, see Davie (1961).

Edinburgh's regulations, published for the first time in the Edinburgh University Calendar of 1864-5, stipulated that the candidate had to be an MA of at least one year's standing and over the age of twenty. The DSc in physical and natural science was awarded on the basis of a higher examination only; in mental science it required in addition an original essay; in philology more stress was laid on a dissertation involving research, but this too was accompanied by an examination. All three branches also demanded participation in an exacting one-year course of instruction.

Over the next thirty years Edinburgh's regulations underwent a number of changes which progressively increased the research element. From the late sixties onwards, first class Honours philology graduates of Edinburgh could obtain the doctorate purely on the results of a year's research work. By the early eighties, the DSc in mental science was awarded in the same manner. But Scottish students who did not have a first class Honours degree, together with all graduates of other universities, continued to be required to attend a course and take an examination at the end of twelve months, as before. Meanwhile, in 1875, the qualifying period for the DSc was extended to three years after graduation and in the early eighties to five years. Between 1866 and 1887 a total of fifty-one DScs were awarded at Edinburgh: eleven in mental science,[2] six in philology and thirty-four in natural and physical sciences. So far as the other Scottish universities were concerned, although Aberdeen calendars contained some regulations for a doctorate in the later 1880s and St Andrews well back in the seventies, no degree appears to have been awarded at the latter and Glasgow did not even publish regulations.

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[1] Then — as until quite recently — the MA was the one and only first earned degree in Scotland, the BA having fallen into disuse long ago. Scotland had no residential college system, and the circumstances which degraded university degrees, and in particular the MA, in England, never affected Scotland, so that its strong Masters degree if anything swallowed up the Bachelors degree, rather than the other way about as in England. Attempts to revive the Bachelors degree during the nineteeth century did not succeed.

[2] This figure might well have been raised to twelve by Richard Burdon Haldane, who recalls in his autobiography how, after gaining a first class Honours MA at Edinburgh, 'I thought I ought to take the Degree of Doctor of Science in Philosophy. I sent in the requisite thesis. The subject I chose was Immortality. The thesis was approved by the Professors of Philosophy. But technically it had to be approved also by the Dean of ... the faculty of Science. He was a very orthodox believer of the old school and he firmly refused to sanction a thesis which contained what he considered to be a dangerous doctrine. So I never became a DSc' (Haldane 1929 pp. 20-21).

However, fresh initiatives were taken in 1889, when Royal Commissioners were appointed for the Scottish universities 'with executive powers directed toward bringing the university system more into line with the greatly extended training demanded by conditions of modern investigation and scholarship.'[1] Edinburgh, as the only university with some experience of research doctorates, soon asserted its right to promote these further. In 1891, her arts faculty proposed 'that Senatus should request the University Commissioners to institute Doctorate Degrees in Arts.'[2] It was clearly anxious that the proposed science faculty, which was then under discussion, should not dominate the nomenclature of higher degrees and that there should be a doctorate of letters as well as of science. In the event, inspired by a communication from the Commissioners, the arts faculty broadened its earlier suggestion even further and recommended 'that Doctorates in Arts be established under the separate titles of Doctor of Letters — DLitt.; Doctor of Philosophy — DPhil.; and Doctor of Science — DSc.'[3] And these were the titles finally agreed for all Scottish universities in 1895.

The three degrees, with very similar regulations,[4] were all to be open to Masters of Arts of at least five years' standing with first or second class Honours in the appropriate discipline[5] at any Scottish university. Candidates had to 'present a thesis or a published memoir of work' which was to report on 'an original research' and, if required by Senatus, also had to submit to an oral or other type of examination on the subject of their thesis. Scottish graduates were permitted to do their research wherever they pleased but graduates of other (recognized) universities had to complete a minimum of two winter sessions engaged in research at the Scottish university to whose doctorate they aspired.

Nevertheless, from the foreign student's point of view, and especially the American, a five-year Scottish doctorate compared most unfavourably with the two-year German PhD, or even the one- or two-year research bachelorships of Oxford or Cambridge. Professor Wenley, the Scottish philosopher who held a chair at Michigan, tackled this problem in an article in an American journal, in which he showed the disadvantages of the ancient English universities while ingeniously likening the Scottish universities to the German. He stressed that fees at Scottish universities were moderate, that they were non-residential, that they admitted women and that Scottish students were hospitable and friendly. Moreover, the methods of instruction approximated to the German: 'less supervision and more self-reliant individual work is the Scotch keynote.' And, as a final trump card in this display of Scottish wares, he reminded his American readership that it took only 'thirty-six hours from Leith to Hamburg, thence anywhere in a day. ...'[1] 'The residence requisite at the university granting the degree, is two winter sessions — i.e. from Mid-October till the end of March. During the intervening six months and a half the student would be entirely free to do as he pleased. In this way it would be quite possible to combine a German with a Scottish experience during a stay of two years in Europe.'[2]

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[1] Wenley (1897) p. 214.

[2] University of Edinburgh, Minutes of the Senatus Academicus, 28 November 1891.

[3] University of Edinburgh, Faculty of Arts, Report on Doctorates in Arts, presented to the Senatus Academicus of the University of Edinburgh 26 March 1892.

[4] Under Ordinance No. 62 of the Scottish University Commissioners as approved by Order in Council, 29 June 1895.

[5] The DSc required a BSc or MB or MA in mathematics or natural philosophy, the DPhil a first degree in mental philosophy and the DLitt a first degree in any other subject.

Financial support for research students in Scotland — Carnegie

While American students did not flock to Scotland for the five-year doctorate, neither was that degree very popular among Scottish MAs. For the institution of higher degrees serves little purpose if it is not accompanied by the provision of adequate facilities for research and some financial support for those engaged in it.

Recognizing this problem, the Edinburgh faculty of medicine, which already at that time enjoyed a world-wide reputation, requested the Senatus Academicus to initiate a scheme by which the university would pay the laboratory expenses of its young and able graduates in medicine to encourage them to engage in original research. In welcoming this proposal, the Senatus Academicus suggested 'that a like provision for original works should be made in the other Departments of the University, where there are Laboratories.'[3]

In the event, the Royal Commissioners' 'Regulations for the Encouragement of Special Study and Research and for the Appointment of Research Fellows' created the title of 'research student' and empowered the Scottish universities to elevate those 'who have shown special distinction' to the title of 'Research Fellow'.[4] Whilst this did not in itself carry a stipend, the University Court was empowered to 'provide such sums as it may think fit in aid of the expenses of special study or research.'

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[1] Wenley (1897) p. 221.

[2] Ibid. p. 218.

[3] University of Edinburgh, Minutes of the Senatus Academicus, 27 January 1894.

[4] Among the first of these research fellows was the ageing Lord Kelvin who, on resigning his chair, had assumed this title as a demonstration of his faith in the new regulations (Morgan 1933 p. 128).

This last provision remained ineffective for lack of funds, but before long the fortunes of the Scottish universities took a turn for the better, when Scottish-born American, Andrew Carnegie, bestowed upon them the gift of ten million dollars. This was to constitute the financial backbone of Scottish students and provide major facilities for study and research in the Scottish universities of the twentieth century.

Originally Carnegie had intended to give five million dollars to finance needy Scottish undergraduates, but a number of people felt that there were other, more important calls to be answered. One, whose intervention carried much weight, was the then Chancellor of Edinburgh University and First Lord of the Treasury in Salisbury's cabinet, A.J. Balfour. His views on this subject are of interest, not only because they proved to be so immediately effective in support of research, but also because they displayed certain attitudes which eventually led him, as Foreign Minister, to play an important role in persuading British universities to introduce what he called a 'proper research degree' — the doctorate of philosophy.

In May 1901, Balfour wrote to thank Carnegie for his splendid generosity. Referring to that part of the gift which was to purchase equipment for scientific teaching, Balfour remarked that he had been 'amazed and almost ashamed, at the indifference with which the British public have acquiesced in the wholly inadequate provision which we make for scientific teaching and research, and this not merely in the Scotch Universities, but at Oxford, Cambridge and other great historic places of learning. According to my view, (which I think you share), we ought to regard our Universities not merely as places where the best kind of knowledge already attained is imparted, but as places where the stock of the world's scientific knowledge may be augmented. ...

'I have often wondered whether, as part of a University equipment of the scientific side, there could be provision to stimulate postgraduate *research*. ...'[1] Carnegie reacted with characteristic impetuousity: he would double his gift, so that an additional five million pounds would be invested to provide buildings and facilities as well as scholarships and fellowships for students engaged in postgraduate study or research.

The scholarships at £100 and fellowships at £250 per annum — a very generous stipend for those days — were first awarded in 1903. Their number and total value in any particular year remained flexible; during the first twenty-two years of the scheme, the awards averaged twenty per year and, in addition, an average of eighteen grants per year went to older research workers engaged in specific research projects. During the first fifty years of its existence, the Carnegie Trust spent well over half a million pounds on scholarships, fellowships and research grants, more than a quarter million on libraries and more than half a million on buildings and equipment.

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[1] A.J. Balfour to Andrew Carnegie, letter dated 21 May 1901 (Add MSS 49742 Balfour papers, British Museum).

At least in Scotland then, a substantial beginning had been made in financial support for the training of research students and an important impediment removed to their growth in numbers.

The 1851 Science scholarships

During the early nineties of the last century, another important fund had become available for similar purposes — in this case for postgraduate students in science from provincial and colonial universities. Forty years before, in 1852, Lord Playfair had proposed that part of the gigantic profits made on the 1851 International Exhibition in London should be used for science scholarships.[1] The aim was to finance young graduates while they were training in research so that they might eventually make a real contribution towards Britain's wealth and prestige in a very competitive world. In the event the idea was shelved and a considerable proportion of the surplus used to purchase the South Kensington site where to-day stands Imperial College — for a great 'Science Centre' much favoured by Prince Albert.

When in 1889 the Commissioners had at last completed their transactions, a residue remained, and Playfair seized the opportunity to return to his original idea. A Science Scholarship Committee was set up, consisting of Norman Lockyer, Thomas Huxley, Roscoe and W. Garnett, with Playfair himself as chairman. They worked out a scheme for scholarships in 'those branches of science (such as physics, mechanics, and chemistry) the extension of which is specially important for our national industries.'[2] It came into operation in 1890.

A scholarship of £150 a year, tenable for two to three years by students of not less than three years' standing who show 'high promise and capacity for advancing Science or its applications'[2] was a generous concept. Equally far-sighted was the provision that they be awarded to students from designated provincial and colonial colleges and held anywhere at home or abroad, though not normally at the institution at which the first degree had been taken.[3] With £5,000 a year firmly set aside for these scholarships and their bold terms of tenure, it is not surprising that the scheme became very popular and, indeed, served as a model for similar schemes in years to come.

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[1] Crowther (1965) p. 139.

[2] Report of the Science Scholarship Committee to the 1851 Commissioners, June 1890, quoted in Reid (1899) p. 443.

[3] This underlying principle which recognizes the value of a change of university between undergraduate and graduate years has often had lip-service paid to it since, but, even to-day, few schemes insist on it, hampered no doubt by the desire of the professor to hold on to his best students and the student's own preference for 'the devil he knows'.

The July 1898 Report of the Commissioners stated that of the seventy-nine students who had already held these scholarships, thirty-nine were now engaged as teachers of science in various educational institutions and a further twenty-six had obtained posts in manufacturing firms or in public departments. At last the country was beginning to benefit from a steady flow of young researchers whose ability to solve problems scientifically was the best answer to the fierce competition from abroad.[1]

The Rhodes scholarships and their far-reaching influence on Oxford

One other scholarship scheme came into existence around this time and was to have a profound effect on one particular university. Indeed it was the institution of the Rhodes scholarships, as much as any other factor, which caused Oxford to change her attitude towards postgraduate studies during the next twenty years.

The story of Cecil Rhodes's astronomical financial success in the South African diamond mines, his political exploits and blunders, are common knowledge, but less so perhaps, the reasons why this multi-millionaire came to distribute his wealth in the way he did. A highly obstinate character and unfortunate manner had practically precluded any close and lasting personal relationships, leaving Rhodes with no obvious heir by blood or by friendship. But there had been one 'home' in which he had always felt happy, and that was the college and university to which he returned intermittently over many years, keeping terms at Oriel in between his money-making sojourns in South Africa. It was the lack of an heir, his love for Oxford and, above all, the vision of his money being used to perpetuate the British Empire (which had provided him with his millions and in which he believed so strongly), that led to the world-famous will of one of Oxford's more notorious, if academically less notable, sons.

Convinced of the superiority of the English-speaking world, he sought to enhance the quality of its leaders by enabling them in mutual contact to broaden and develop their minds in the aristocratic atmosphere of Oxford. It was to this end that, in the seventh and final version of his will (1899), he directed that a large part of his massive fortune be used as a scholarship fund to bring the 'right type' of student to Oxford. These future

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[1] By 1915, the numbers of ex-science research scholars working in these spheres had quintupled, but clearly the scheme was still providing nowhere near enough scientists trained to a really high level. That year saw the formation of the embryo DSIR and in 1920 its schemes began to give a much needed boost by supporting students from home universities. The 1851 scholarships were then raised in value, reduced in number, and henceforth only awarded to students from the dominions.

Empire builders would be selected not merely as bookworms, but for 'qualities of manhood, truth, courage, devotion to duty, sympathy for and protection of the weak' as well as 'fondness of any success in manly outdoor sports such as cricket, football and the like. ...'[1]

With such provisos it may well be asked how it came about that these scholarships could benefit advanced students, especially if it is borne in mind that Rhodes had also expressed a preference for students coming straight from school. Indeed the trustees and others concerned with the administration of the funds and selection of students had to engage in some ingenious contortions to overcome some of the more awkward provisions of the will in order to optimize the value of the scholarships both to the students and to the university. It was certainly indicative of the growing appreciation of graduate studies that — over the years, as circumstances permitted — the scholarships should have been increasingly awarded to postgraduate students. Indeed, from the very beginning, they were confined to applicants who had already spent some years at their home university.

Rhodes had willed ninety-six scholarships to the United States (two to each state) and a further seventy-eight to Colonial students.[2] Tenable at any Oxford college for three consecutive years, at £300 per annum, the very number and size of the awards was bound to make a considerable impact on the university.

What then did Oxford have to offer to this great influx of students from overseas? By now there was a choice of four Bachelors degrees as well as two doctorates awarded after five years' standing from graduation for original work of a very high standard. The great majority of American students came to Europe already in possession of a Bachelors degree. They therefore looked forward to a year or two of serious specialization culminating in the PhD, which by now had come to represent the entrance ticket to the academic world in the States.

Oxford had no PhD and the normal residence required for an Honours BA was three to four years. As a great concession, a new status of junior and of senior student had been written into the statute book, which excused from one year's residence those from certain 'affiliated' colleges in Britain[3] and from a growing number of 'privileged' colonial universities.[1] If they had studied for three years or more and obtained an Honours degree at their home university, they were excused moderations. But it was only after several years of efforts to recruit American Rhodes scholars that foreign universities were also admitted to 'privileged' status.[2] In the meantime, as a writer in the *Oxford Magazine* correctly pointed out, 'the fact that a man has *slept* a sufficient number of nights at Cambridge, [means that he] need spend less time in order to get a degree at Oxford, than the most distinguished graduate who has *studied* at Harvard or Berlin.'[3]

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[1] Kerr (1927) p. 88.

[2] There was also that final quirk of Rhodes, during the last year of his life, which in the momentary afterglow of a happy business deal with the German Kaiser, led him to make a codicil to his final will in which he allocated five annual scholarships of £250 each to young Germans who were to be chosen by the Kaiser himself.

[3] The earliest of these were St. David's, Lampeter, 1880; University College Nottingham, 1882; Firth College Sheffield, 1886; and Reading University College, 1899.

Oxford woos American students

While the opportunity was used in the summer of 1902 to consult representatives from colonial countries who were present in London for the coronation of Edward VII,[4] it was not until the following year that the Hebdomadal Council began to undertake a close examination of the Rhodes scholarship scheme in relation to American students.

On 2 February 1903 it set up a 'Committee on Students from the United States' which recommended that it was 'desirable to extend to members of certain Universities in the United States of America privileges similar to those granted under the provisions of the Statute on Colonial and Indian Universities.'[5] This, and their further suggestion that the presidents of the Universities of Harvard, Yale, California, Columbia, Cornell, Princeton, Ann Arbor, and Chicago should be consulted as to whether they 'would welome such legislation and would assist Council in determining the conditions under which such privileges might be granted,'[5] were accepted by the Hebdomadal Council.[6]

The vice-chancellor's inquiry from the presidents of the above-named universities elicited co-operative replies from Presidents James B. Angell of Ann Arbor, Nicholas Murray Butler of Columbia and Arthur Hadley of Yale; the response from Charles Eliot of Harvard, the doyen of them all, was however couched in less than enthusiastic terms.

Having pointed out the great differences betwen Harvard and Oxford BA[illegible], Eliot explained that while the 'British Colonial universities have naturally copied in some measure the methods of Oxford and Cambridge

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[1] In 1888, the Universities of the Cape of Good Hope and of Sydney were the first to achieve this status and by 1906 twenty-four Indian and colonial universities had availed themselves of the privilege.

[2] See below, p. 77.

[3] D.G. Ritchie in a communication to the *Oxford Magazine*, quoted in Jones (1892) p. 449.

[4] See below, pp. 101-2.

[5] Report of the Committee on Students from the United States, 19 February 1903 (21 February 1903, HC/M/3/19, Oxford University Archives).

[6] At its meeting of 2 March 1903.

Universities: since 1850 the American universities have not. They have been much more influenced by the German. There is no likelihood that the American BA will in the future be assimilated to the Oxford or Cambridge BA. ...'

He thought it possible, however, that the Rhodes scholarships might, as a 'money prize', 'induce some young Americans to make special preparation at home for passing Responsions, with the object of spending three years at Oxford as undergraduates, and taking the Oxford BA.' Moreover, 'Oxford and Cambridge might attract some graduates of American colleges if they would, in the first place, provide a considerable body of instruction intended for men who already hold the degree of Bachelor of Arts, and then admit to such instruction, just as Harvard University does, holders of that degree from any American college or university.' This would involve 'a large addition to the body of instruction now supplied by Oxford or Cambridge University; but, that addition being made, the English universities would probably divert from the German universities a good proportion of American students who now go to Germany in large numbers. Such students from the United States would not necessarily be in search of any degree; although a degree analogous to the German PhD would doubtless contribute to the success of the plan.'[1]

Shortly after this, President Eliot received a printed brochure about courses and degrees open to colonial and Indian students at Oxford.[2] His blunt response to this was that these would not be of sufficient interest to American students to make it worth Oxford's while to change her statutes to accommodate them.

'The degrees of Bachelor of Letters and Bachelor of Science offered by Oxford would not be attractive to Americans, because in America these degrees are distinctly inferior to the degree of Bachelor of Arts.[3] Again, the degrees of Doctor of Letters and Doctor of Science, as offered by Oxford, would not be attractive to Americans, because they can be obtained without residence and without personal instruction from one or more university professors. American students do not value such degrees unless they are distinctly honorary, conferred as compliments or recognitions of merit.

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[1] Charles W. Eliot to David B. Monro, Vice-Chancellor of the University of Oxford, letter dated 25 July 1903 (Correspondence with Presidents of various United States Universities, 28 October 1903, HC/M/3/19, University of Oxford Archives).

[2] This had been drawn up after the consultation with colonial representatives in the summer of 1902 (see below, p. 102), and copies had now been sent to American university presidents for their information.

[3] The Bachelor of Letters (BL) was at that time being awarded by 'Literary Colleges' and, along with the Bachelor of Philosophy (BPh), represented a somewhat debased currency. Neither was the Bachelor of Science (BS) ever associated with graduate work in the States.

'None of the higher degrees offered by Oxford University, as described … could, I think, compare in attractiveness for American students with the German degree of Doctor of Philosophy.

'I have written very frankly because I thought it might be convenient for you to know how the proposal strikes an American University president, who has rather a long experience. You will, I am sure, know how to make appropriate use of the opinions that I have expressed without giving them publicity.'[1]

As President of one of America's foremost universities, whose provision of postgraduate study was at that time even overtaking Johns Hopkins, Eliot was not overly impressed by Oxford's offer to ease the path of Harvard's graduates desiring to obtain her Bachelors degrees.

Nevertheless, Oxford proceeded with her proposal and as early as June 1904, an MA from Harvard applied for senior student status. Ironically, before the end of that year Harvard was also the first foreign university to be granted privileged status under the new statute.[2] President Eliot was right, however, in his prediction that the best American students would not be attracted by what Oxford had to offer at that time. There was much concern about the low academic level of American Rhodes scholars and although records show that during the first twelve years of the scheme's existence they did better than the average Oxford student, they did not come up to the standard of Oxford scholars, nor to that of Rhodes scholars from Canada, Australia and New Zealand.[3]

Yet during those first twelve years more than four fifths of these American students came to Oxford already in possession of a BA, and of these twenty-two per cent had completed one or even two years of postgraduate studies at an American university. Only twenty per cent of American Rhodes scholars went on to the higher Bachelors degrees of BCL, BSc or BLitt after a two-year Oxford BA; a considerable proportion took three years over their BA. Very few took up studies for a higher bachelorship immediately on coming to Oxford.[3]

Able colonial students, on the other hand, were more strongly motivated to take up Rhodes scholarships. Not only were there far less opportunities to obtain scholarships of fellowships in their own countries but, because of their political and administrative ties with Britain, they knew that what they learnt at an English university — whether it be law or economics or indeed most other subjects — would serve them well in their home country, where the best posts would be open to them.

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[1] Charles W. Eliot to David B. Monro, Vice-Chancellor of the University of Oxford, letter dated 28 July 1903 (Correspondence with Presidents of various United States Universities, 28 October 1903, HC/M/3/19, University of Oxford Archives).

[2] Wisconsin and Princeton followed in 1905 and Michigan in 1906.

[3] See Aydelotte (1920).

Oxford provides no training in research

Oxford's F.C. Schiller, who had taught at Cornell during the 1890s, asked what Oxford could offer to the coming 'invasion' of 'more than one hundred ambitious young Americans, mostly looking forward to some sort of teaching as a career, and eager to take a degree which will increase their reputation. ...

'At first no doubt, the reply will be: There are new Research degrees: you can become Bachelors of Science and Letters without Greek and without passing "Smalls" and when you have elaborated your dissertations and published them in the shape of "contributions to science or learning" we shall be pleased to make you Doctors of Science or Letters, as soon as you have £50 or so to spend on fees and gowns.' And it must be admitted that in the light of what has now happened, the institution of these degrees appears to have been wise and statesmanlike.

'But how about the instruction of candidates for these degrees? At present graduate instruction ... is not so much unorganised as non-existent in Oxford. In this respect we are far behind America, even allowing for the fact that high Honours in Oxford imply attainments far above what is needed for any American baccalaureate.'[1]

H.P. Biggar, a Canadian who had himself only recently taken the BLitt at Oxford, could write from his own bitter experience: 'So little is the importance of method recognised at present in Oxford that unless the student who goes there for graduate work is already in possession of this important asset, he stands a very good chance of coming away again without it. ... The Rhodes scholars who came up to undertake postgraduate work have thus been grievously disappointed.'[2] He fervently advocated a graduate school 'on the Banks of the Cher'.

A writer in the *American Educational Review*, comparing facilities for postgraduate work in Berlin and at Oxford, made no apology for devoting nine out of his eleven pages to Berlin. 'For,' as he said, 'in the first place very few American students go to Oxford for postgraduate work; and in the second, there is no postgraduate work in Oxford to go for. ...'[3]

And — he might also have added — information on the few opportunities that did exist, was extremely difficult to obtain. In 1900, a club of American students at Oxford, which had been formed with the express purpose of remedying this situation, published a booklet entitled *Conditions for Advanced Study at Oxford University.* Apologizing for its inadequacy, they explained 'the difficulty of obtaining precise information about graduate study from a University which concerns itself primarily with undergraduate work.'[1]

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[1] Schiller (1902) p. 818.
[2] Biggar (1906) p. 124.
[3] Bishop (1898) p. 360.

Oxford's lack of serious graduate instruction was also the subject of an epoch-making book published at this time. Written by the university's Professor of Archeology, Percy Gardner, it was to be quoted frequently by fellow university reformers in years to come.

Aspirants to the new degrees of BLitt and BSc had 'to prepare themselves as best they can; they find here neither the *seminar* nor such advanced teaching as they require.' Sometimes Americans intending to take a graduate course at Oxford had reluctantly moved on to Germany. But, Gardner warned, since Rhodes scholars would be coming to Oxford as advanced students, 'if we go on unmoved in our isolation, in a few years we may see at Oxford a number of foreign advanced students and researchers exploiting the wealth of the Bodleian Library, contributing to all the learned journals, using the apparatus of research, while English students go stolidly on their way, regarding such matters as suitable to those who have had the misfortune to be born abroad, but of no account to the real Oxford man.'[2]

Equally, because Oxford provided no training for research, the few English graduates who took up studies abroad were wasting endless time trying to learn how to make use of what they found. 'German and French students armed with all modern appliances, filling their notebooks with systematic knowledge, always on the alert to find what is new or unpublished, are a marvel to them.'[3]

Professor Reichel of the University of Wales, who had visited American Universities as a member of the Moseley Commission in 1903[4] begged his American colleagues to send only graduates as Rhodes students to Oxford. Referring to the 'higher learning which our Philistine upper class neither understand nor care for', he believed that 'nothing would do so much' for its revival 'as a steady supply of picked graduates of an enquiring type.'[5]

One Oxford professor who made a real effort to introduce instruction in methods of research was Regius Professor of Modern History, C.H. Firth. Believing this to be important even at undergraduate level, he introduced the option of a thesis into the modern history degree in 1908. However, as he himself explained later, since this ‘was made an addition to the rest of their work, not a substitute for some part of it, few candidates ... [were] enterprising enough to offer one.’[1]

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[1] American Club at Oxford University (1900).

[2] Gardner (1903) pp. 55-56 and 61. For the immediate thoughts that this book aroused in one Oxford tutor and his charge, see their delightful correspondence portrayed in Warde Fowler (1904) pp. 47-61.

[3] Ibid. p. 56.

[4] Alfred Moseley, English industrialist, operating in the diamond mines of South Africa, had for long been impressed by the ingenuity of the American engineers who worked there, and wanted to know what it was in American education that produced such men. In 1903 he sent a commission to the States to investigate the relations between education and commercial and industrial efficiency.

[5] Reichel (1905) pp. 236 and 237.

So far as postgraduate work was concerned, he strongly believed in a ‘proper professional training’, by which he meant ‘such a technical training as French and German Universities give to future historians, that is a training in methods of investigation, in the use of original authorities, and in those auxiliary sciences which the Germans call "Hilfswissenschaften".’[2]

Believing this to be the responsibility of university teachers rather than college tutors, he persuaded the administrators of the Common University Fund to increase their grant to the school, to enable it to provide extra lectures in palaeography and diplomatic and advanced seminars in sources and bibliography of English history, one of which Firth ran himself. Over a considerable period he also successfully maintained a small practical class for BLitt students on various aspects of seventeenth-century history. However, here too he was to be disappointed, for although these had resulted in some useful publications, attendance at them was poor.

The early years of twentieth-century Oxford were thus marked by attempts to make the new degrees work, but as yet the centuries-old tradition of liberal education continued to stifle the development of specialization and scientific pursuits. So blind was Oxford as yet to the value of the research training provided by the continental universities that in the year 1906 the Hebdomadal Council actually believed itself to be flexible and generous when it agreed ‘that any person who shall have passed either magna cum laude or summa cum laude the examination for the Degree of Doctor Philosophiae at a University of the German Empire, the Austro-Hungarian Empire or Switzerland, shall be eligible for admission to the status and privileges of a Foreign Senior student.’[3] One can hardly blame the German Doctors for not rushing to Oxford to avail themselves of this golden opportunity to read for the Oxford BA in two years instead of three!

The Times *and Postgraduate Study*

Meanwhile, encouraged by a recent Conference of Colonial Universities which had expressed great concern over the lack of graduate courses and facilities for research students at British universities,[4] H.P. Biggar opened an interesting correspondence in *The Times* newspaper, with a letter published under the heading 'The University of Oxford and Colonial Graduates.'[1]

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[1] Firth (1920) p. 43.

[2] Firth (1904) p. 3.

[3] See Hebdomadal Council Papers relating to a meeting of 5 November 1906 (HC/M/3/20, Oxford University Archives).

See below, pp. 103-5.

As a Canadian graduate who had taken a research degree at Oxford, he compared the examination-ridden, school-dominated ancient English universities with the wide-ranging instruction by eminent authorities available in Germany, France and the USA. No wonder the majority of colonial students found their way to the universities of those countries instead.

'Without dwelling on the importance to the Empire of recruiting the future lecturers of colonial Universities from men who have carried on their advanced studies in the motherland rather than, say, in Germany, under such an *Engländerfresser* as was the late Heinrich von Treitschke, or even in the United States, which not only attracts, but retains some of the best Canadian youths, the fact that Oxford is to be the University to which Rhodes scholars are to be sent makes it imperative that some steps should be taken to prepare for graduate work there.' Advanced lecture courses accompanied by research seminars were what the colonial graduate looked for and their provision would draw them to Oxford as nothing else could.

A leader in *The Times* of the same date supported Biggar's viewpoint and the next six weeks saw a heated correspondence in its columns on the now traditional lines of polemic to be expected on such a topic.[2]

Some wrote about the pernicious strangle-hold of competitive and class examinations on Oxford as a seat of learning, while others raised the question of the expense of college life which drove colonial graduates to the much cheaper German universities, or the American where postgraduate fellowships abounded.

Professor A.H. Young of Toronto summed up the situation in no uncertain terms: 'Oxford has ceased to be the intellectual centre of the Empire — a fact which is to be regretted for Oxford's sake no less than for that of the Colonies. The establishment of the Rhodes scholarships is a call to her to assume the leadership and to instil British ideas into the minds of the Colonials rather than allow them to imbibe those that are not British in Germany or America. ... The great migration of Canadian Students to American Universities year by year' meant that 'they spend there the three or four years necessary for the doctor's degree, and either settle down as professors in that country or return with American ideals to Canada. In the one case they are lost to their native land; in the other they propagate views which, if not hostile to England, are at least far from being friendly to her."[3]

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[1] Biggar (1903).

[2] The University of Oxford and Colonial Graduates ... (1903).

[3] Young (1903).

Professor Burnet from Scotland wished to see the creation of a higher faculty of arts, to be added as an upper storey to the existing edifice.[1] Dr Farnell suggested — for what may well have been the first time in Britain — that a period of postgraduate study should be made an essential part of a university teacher's training. Indeed, he wrote, 'no man is fit for the higher teaching posts in college and university unless he has proved that he has the training and faculty for original production.'[2]

Professors Gardner and Firth also contributed to this correspondence in *The Times*, which caused the *Oxford Magazine* to publish a scathing attack on the 'researchers', and on Professor Gardner and the *Times* leader-writer in particular. Clearly enjoying his mischievous exaggerations, the writer referred to the researchers' demand that 'Oxford output shall be comparable to that of the German Empire, its various Universities and Academies, and of the United States of America together. ... The ideals are admirable,' he maintained, but 'we have not attained them, and this shows that we are deficient in the "scientific spirit".'

'Modesty is a good thing, and the only disadvantage of all this vili-nihili-parvi-pauli-pili-nauci-flocci-fication of ourselves is that it interferes with the public appreciation of what we have done, and cuts sadly across our attempts to do more. There is not any real difficulty in providing for postgraduates "whose studies can be profitably pursued within the University"; if their materials are in the Paris archives they must go thither; occasionally and exceptionally they may go to Cambridge.'[3]

Four weeks later, in its Notes and News, the magazine reported that the controversy in *The Times* was not to be allowed to die a natural death and that members of Congregation had been invited to a public discussion on the subject. Moreover, it was rumoured that a statue was to be erected to Mr Biggar and that Professor Gardner would be entrusted with the task of designing it.[4]

However, two weeks later again, in more serious vein, the magazine was able to inform its readers that a well-attended, high-powered 'meeting to discuss advanced studies' had taken place. No less than eight heads of houses and about a dozen professors had been present and one of the subjects discussed was the proliferation of specialized diplomas as a means of encouraging advanced studies.[5] The following year saw the first edition of a new publication entitled *Oxford University Programme of Special Studies*, which informed its readers of the recent introduction of diplomas in education, geography, economics, engineering and mining, anthropology and forestry.[1]

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[1] Burnet (1903).
[2] Farnell (1903).
[3] Oxford in *The Times* (1903).
[4] Notes and News (1903).
[5] The Meeting to discuss Advanced Studies (1903).

Curzon's efforts to persuade Oxford to reform

In 1907, *The Times* once again opened its columns to the topic of postgraduate studies at Oxford, when it carried a series of articles on the endowment of research, the need for new faculties to cater for higher professional studies other than medicine, theology and law, the institution of seminars, the concept of a dissertation as a means of training rather than a great original work, and other relevant topics.[2] There is little doubt that the questions raised here, and the ensuing demands for a Royal Commission on the State of the University of Oxford,[3] determined Lord Curzon, who was then embarking on his eighteen-year chancellorship of the University of Oxford, to declare himself on the subject. By publishing his detailed proposals for university reform, he hoped to demonstrate to the outside world that Oxford could be trusted to tackle the necessary changes from within.

In a chapter entitled the 'Encouragement of Research', Curzon referred to the major criticism levelled against Oxford, that her 'lack of true scientific spirit' led to 'an almost total absence of the apparatus and machinery by means of which the student can, under the eye of his master, acquire the methods of higher study, and scale the topmost rungs of the ladder of learning.'[4] He himself did 'not think that it would be desirable, even if it were feasible, to convert Oxford into a place where the main occupation should be the pursuit of original Research, or where all the best men after taking their degree should settle down for a year of advanced study. ... Conditions of university education being so different and the line of demarcation between undergraduate and postgraduate study being so much less clearly defined in this country,'[5] he did not feel that Oxford could emulate the American universities so far as postgraduate study was concerned.

'Still, we can acknowledge our duty and endeavour to provide for it, cordially accepting the postulate that it is the function of a modern

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[1] Oxford, University of (1905).

[2] Later that year *The Times* published these articles as a book: *Oxford and the Nation: by some Oxford Tutors* (1907)

[3] In the House of Lords, Bishop Gore of Birmingham's proposal that the government set up such a Royal Commission was countered by the Earl of Crewe's diplomatic caution that more time was required to determine whether such a Commission was in fact the best solution at this stage (see Lords, House of, 1907).

[4] Curzon of Kedleston, Lord (1909) p. 179.

[5] Ibid. p. 181.

University to give the highest possible teaching in any branch of learning included in its curriculum, and that Oxford should train its scholars not merely to acquire knowledge, but to increase it.'[1] He therefore recommended that the university and the colleges should examine thoroughly what resources were or could be made available for research purposes and especially for research fellowships and senior scholarships. 'The real need at Oxford,' he suggested, 'is not more advanced teachers, but more advanced students.'[2]

Curzon soon became disillusioned about the effectiveness of his intervention, as is clear from a letter he wrote — only two years later — to Dr Herbert Warren, President of Magdalen. Remonstrating that he had done everything in his power to prevent a Commission of Inquiry 'in the belief that the University would voluntarily and successfully and with reasonable speed' proceed with the reform contained in his proposals, he lamented that 'this belief' had 'been greatly weakened by events. Council and Congregation go pottering along term after term, amending and revising and postponing ...' and this led nowhere.[3]

But while Oxford was so exasperatingly slow to reform herself, clearly so was the government reluctant to pursue the idea of a Royal Commission, and soon the matter was conveniently taken out of their hands by the outbreak of war.

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[1] Ibid. p. 181.
[2] Ibid. p. 187.
[3] Magnus, L. (1932) p. 142.

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LONDON AND PROVINCIAL UNIVERSITIES MOVE AHEAD

State aid for universities — essential for the development of their research function

Meanwhile the science politicians continued to argue with ever increasing urgency for more trained scientists and technologists. These pleas were increasingly accompanied by demands for state help to provide the necessary laboratories, libraries and equipment, not only for teaching and training but also to harness maturer talent to research and development — so essential if Britain was to maintain a leading position in industry and trade.

Such private benefactions as there were had now become totally inadequate, and even in America, with its abundance of wealthy philanthropists prepared to spend their conscience money on educational purposes,[1] the state was playing an increasing role in the highest education and research.

In his presidential address to the British Association in 1885, Lyon Playfair had pointed out the short-sightedness of the British government's miserly attitude towards the universities. He compared its annual grant of £30,000 for the four Scottish universities with little Holland, which also had four universities, but whose government provided them with £136,000 a year! And then again, Strasbourg and Leipzig each received more from their governments than all the Irish and all the Scottish universities put together. Each year Prussia spent nearly £400,000 on her universities and France, which had made great strides since the Franco-Prussian war, spent £500,000 on her provincial colleges alone. These countries 'are fully aware that science is the source of wealth and power, and that the only way of advancing it is to encourage universities to make researches and to spread existing knowledge through the community. ...'[2]

In the early twentieth century another president of the British Association delivered one of the most forthright public addresses ever given on that delicate and somewhat un-British subject of state aid to universities. For more than thirty years Norman Lockyer had been in the forefront of the battle for state support for university research and the training of advanced students.[1] His patience had clearly been stretched beyond endurance and his speech was calculated to shock the BA out of its lethargy. In the event it was also to have strong repercussions in much wider circles.

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[1] R.B. Haldane commented caustically that in Britain, 'if a millionaire devotes himself to making money selfishly all his life, if he feels a little uneasy about the future as he gets towards the end of his life, he builds a church or makes a contribution to some sustentation fund. In America his national spirit comes to his rescue and he founds a University or gives a large contribution to Yale or Harvard.' Haldane's own belief was that 'in the end the one millionaire will be just as well off as the other' (Haldane 1901 pp. 61-62).

[2] Playfair (1885) p. 13.

'University competition between States is now as potent as competition in building battleships,' said Lockyer, 'and it is on this ground that our University conditions become of the highest national concern. ... Chief among the causes which have brought us to the terrible condition of inferiority as compared with other nations in which we find ourselves are our carelessness in the matter of education and our false notions of the limitations of State functions in relation to the conditions of modern civilization.'[2]

How could our thirteen assorted British institutions possibly stand up against the block of twenty-two state universities of Germany and the huge array of American state and private colleges and universities. 'To compete on equal grounds with other nations we must have more Universities. But this is not all — we want far better endowment of all the existing ones, not forgetting better opportunities for research on the part of both professors and students.'[3]

Having spent the previous year inquiring into the financial needs of English universities, it was clear that 'even Oxford, our oldest University, will still continue to be a mere bundle of colleges unless three millions are provided to enable the University, properly so called, to take her place among her sisters of the modern world; and Sir Oliver Lodge, the Principal of our very youngest University, Birmingham, has shown in detail how five millions[4] can be usefully and properly applied in that locality to utilise for the good of the nation the enthusiasm and scientific capacity which are only waiting for adequate opportunity of development.'[5]

£24,000,000 were required for organizing, building and endowing new universities and making existing ones more efficient. And this, Lockyer commented, represents 'less than half the amount by which Germany is yearly enriched by having improved upon our chemical industries, owing to our lack of scientific training.'[1]

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[1] See, for example, Lockyer (1870), where he debunked as a 'purely sentimental notion' the objection to state aid on the grounds of its having a paralysing effect on scientific and philosophical enquiry.

[2] Lockyer (1903) p. 27.

[3] Ibid. pp. 30-31.

[4] Reference is made here to Sir Oliver Lodge's 'Survey of Sciences', in which he put forward a scheme for a Scientific Centre at Birmingham, costing five million pounds (see below, p. 97).

[5] Lockyer (1903) pp. 36-37.

Prime Minister Balfour himself had said that no 'man who looks round the equipment of our Universities or medical schools, or other places of education can honestly say in his heart that we have done enough to equip research with all the costly armoury which research must have in these modern days. We, the richest country in the world, lag behind Germany, France, Switzerland, and Italy. Is it not disgraceful? Are we too poor or are we too stupid?'[2]

Even Chancellor of the Exchequer Austen Chamberlain had recently stated there was 'nothing more important than to supply the deficiencies which separate us from those with whom we are in the closest competition' and that the government might soon have to 'find a little more money' to eliminate our deficiencies with regard to 'the higher education of the people'.[3]

Finally, Lockyer recalled the words of his predecessor in the presidential chair of the Association half a century before, who, referring to the 'impediments' to scientific progress had suggested that 'they are such as can only be successfully dealt with by the powerful arm of the State or the long purse of the nation.' Thus Prince Albert in 1859![4]

And to guide that powerful arm of the state, Lockyer now proposed the setting up of a national scientific council — an idea that was by no means new. Indeed, such an advisory council of experts to ensure that government policy reflected the needs of the day had been the dream of Charles Babbage and James Heywood, and also — thirty years ago — the positive recommendation of the Devonshire Commission. Germany naturally had such a body, comprised of representatives from government, industry, agriculture and the universities; it was proving of inestimable value to that country.

Lockyer was emphatic that Britain's whole future, in peace and in war, depended on government recognition of the importance of scientific advance. This could only be maintained by consistent public pressure and here the Association had an essential role to play, by providing the nation with 'a powerful, continuous, reasoned expression of scientific opinion, urging in season and out of season that we shall be armed as other nations are, with efficient Universities and facilities for research to uphold the flag of Britain in the domain of learning and discovery, and what they alone can bring.'[1]

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[1] Ibid. pp. 38-39.

[2] Ibid. p. 41 (in a speech at a dinner for medical graduates held on 22 May 1901, reported in *Nature* 30 May 1901).

[3] Ibid. pp. 25 and 26 (see also *The Times* of 6 November 1902). While Lockyer was happy to quote him extensively, he must have been doubly disappointed when — soon after this — Chamberlain's 'little more money' proved to be just that — a little more!

[4] Ibid. p. 51.

The BA responded by agreeing to sponsor a deputation to the government demanding 'increased national provision for university education'. Lockyer personally contacted a large number of institutions and individuals with the aim of securing six to twelve representatives from each university locality, including chancellors, MPs and civic dignatories. On 15 July 1904, this deputation called upon Prime Minister Balfour and Chancellor of the Exchequer Austen Chamberlain.

Mr Balfour agreed on the need to create 'positions which will enable a man who had exceptional gifts of originality in science to devote his life' to research in the service of the country.[2] As for the funds to finance these, the chancellor of the exchequer (who happened to be the son of one of the delegates, Joseph Chamberlain) reminded them that the grant to universities had been doubled that year and added that he hoped Parliament would sanction its doubling again. Grandiose as this may have sounded, the figures involved were extraordinarily small, for, in the event, the state subsidy for English universities rose from £69,000 in 1904 to £115,000 in 1905-6, which was still less than one quarter of what the Prussian state alone spent on its universities.[3]

Clearly the government's thinking was on an entirely different scale from that envisaged by Lockyer. Neither did his efforts to revive the British Association as an effective pressure group seem to be gaining much ground. He therefore turned his attention to the building of a new organization. And just as the BA had grown out of the frustration experienced by Babbage, Brewster and others over the ineffectiveness of the Royal Society, so the British Science Guild grew out of the dissatisfaction of Lockyer and others with the BA. Its early champions, besides Lockyer, included R.B. Haldane who was its first president, Henry Roscoe, Sir Gilbert Parker, Philip Magnus and William Ramsay.[4]

The list of leading men inside and outside the universities who made public utterances, comparing the paltry contributions of the British government with those of the continent and the States, was daily growing. True, the small annual grant to universities and university colleges was gradually being increased and reports on these grant-aided institutions, as well as various Treasury Minutes, showed that the government was no longer entirely unaware of the deficiencies in postgraduate education.

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[1] Ibid. p. 50.

[2] See Howarth (1931) p. 237.

[3] Cardwell (1957) p. 155.

In 1936, the British Science Guild re-united with the BA, since it appeared to both bodies that their aims and objects had grown to be increasingly similar!

One such report, for example, on Bedford College, London, declared somewhat pathetically: 'The amount of postgraduate work done by students at the College is small.' But, it continued brightly, 'several former students have done excellent work elsewhere. One student, who has discovered a new form of calcium carbonate, has recently been awarded the degree of PhD of the University of Munich; another has taken the same degree at the University of Zürich; another has published several papers on scientific subjects and is now DSc and a member of College staff and it may be noted that another member of staff, the Lecturer in Moral and Mental Science, who holds a Travelling Research fellowship awarded to her by the University of Wales, has been watching methods employed in Experimental Psychology at the University of Würzburg. ...'[1] In short, here was one of London's colleges proudly reporting that three out of its four star students had acquired research experience, training and qualifications at other universities — in Germany and Switzerland.

Not long after this, the University Colleges Committee[2] under Haldane's chairmanship, reported that it was 'impressed in particular with three defects generally observable in the university colleges; 1. the absence of provision for postgraduate scholarships and fellowships; 2. the lack of equipment in books and in scientific appliances; and 3. the insufficiency of the remuneration of many of the teachers. ...' Altogether there is 'a lamentable absence of provision in places of higher learning for the encouragement of students of marked ability to continue their student life, after a degree has been taken, by engaging in special inquiry or research. ... The extent to which diffusion of expert knowledge in applied science in Germany and the United States exceeds its diffusion with us is in considerable measure traceable to the greater opportunities of postgraduate work which are open to the student in those countries.'[3]

Their recommendation for the establishment of a permanent committee to advise the Treasury on university grant-in-aid and its distribution and the inspection of the universities and university colleges was accepted, and resulted in the creation, in 1906, of an embryo 'University Grants Committee'.

Meanwhile the various local institutions which during the seventies and eighties of the previous century had been established as university colleges were successfully striving towards full university status and London herself underwent the biggest transformation of its long history when, in the year 1900, it emerged from its impotent status as an examining and degrees conferring body, to take its rightful place as the teaching university of the metropolis.

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[1] *University Colleges, Great Britain, Report on* (1901) p. 37.

[2] Set up in 1904 by Chancellor of the Exchequer Austen Chamberlain, to advise him on the distribution of the government grant.

[3] University Colleges Committee (1905) p. 8.

The reconstituted University of London's new research degrees

Owing to its peculiar constitution, London's degrees had in practice been 'external' from the beginning. In the first years of its existence, candidates had been required to produce certificates of attendance at University College or King's College, but soon other colleges in the United Kingdom were included in this arrangement and candidates for London University degrees were admitted to degree examinations on the basis of attendance certificates from a wide variety of institutions.

In 1849, a supplemental charter extended this scheme to any university in the Empire and nine years later the final step was taken, which opened London's Bachelors degrees to all-comers, irrespective of collegiate attendance. Once private study was accepted as sufficient qualification for candidates to sit the degree, the numbers graduating rose dramatically. But while the figure over the next thirty years was almost four times that of the preceding thirty, the number of candidates for the Bachelors degree went up by a factor of six, and it would appear that the former compulsory collegiate attachment had ensured a considerably higher pass rate.[1]

And this was despite the introduction in 1859 of a 'first' degree examination which all had to pass before becoming candidates for the Bachelors degree. This safeguard was to act as evidence of coherent and continuous study and became a substitute for the Certificate of Attendance at a recognized college. From 1882 onwards, these 'first' BA and BSc examinations became known as the 'Intermediate'.

London's anomalous position as a purely examining body began to be seriously challenged in the early eighties, when the movement to convert her into a teaching university gathered strength. A long and persistent campaign was mounted, which involved heated battles in Parliament, Senate and Convocation. In 1900, after two Royal Commissions of Inquiry, followed by a Statutory Commission, the University of London was at last reorganized into a federal institution.

From then on, students attached to her own colleges in London took 'internal' degrees and all others sat for 'external' degrees. 'In addition,' a handbook published on the authority of Senate in 1904 explained, the university now had 'the functions of promoting research and the advancement of Science and Learning. ...'[2]

An important innovation here was Statute 112, under which the university devised regulations for a new method of reaching the BSc degree — by research. This gave students the option of spending the two years after their Intermediate examination on the preparation of a thesis representing 'a distinct contribution to the advancement of Science'. If it was found to be satisfactory, this could replace the entire Finals examination or, at the discretion of the examiners, some part of it. But if one aim of the new scheme was to rid more mature students of the cramping burden of examinations, this was totally negated by the prolonged uncertainty over whether they would actually have to sit them. As one university professor lamented: 'In exchange for the bread we asked for we have been granted but a stone.'[1]

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[1] Fitch (1900) p. 9.

[2] London, University of (1904) p. 4.

So the submission date for the thesis was moved forward to enable the examiners to judge them well before the time of the Finals examination. If they were satisfied, only an oral examination was required on its contents and the general principles on which it was based. At the same time, however, a clause was inserted into the regulations which stated that 'The BSc Degree by Research shall be permitted only as an exceptional and strictly supervised means of access to an Honours Degree and not as an ordinary alternative to the Pass Examination.'[2]

Beset by problems and restrictions, the degree in fact never took root; between 1906, when the first external BSc by research was awarded, and 1914, when the last external candidate qualified, only thirteen were conferred. The regulations for the internal BSc by research continued to adorn the calendar until 1929/30, but the last was awarded in 1922, which brought their total to twenty, an average of one per year!

A contributing factor to the demise of the short-lived, undersubscribed BSc by research was the institution of the MSc. This was first mooted in 1910 — not as one might have expected, by the faculty of science, but by the faculty of arts. The latter, overlapping with the faculty of economics in the field of history, found that, because there was no MSc and therefore no MSc (Econ), graduates engaged in historical studies who had a BSc (Econ) could proceed to the DSc (Econ) without first obtaining a Masters degree. On the other hand, Bachelors of Arts similarly engaged in historical studies, but for the DLit in the arts faculty, had to take the more difficult route via the MA.

The attention of the Academic Council having been drawn to this anomaly, faculties and boards of studies were asked whether they thought that such a new degree should be instituted and if so, whether it should be wholly or partially taken by research and, accordingly, what its relation should be to the existing BSc by research.

Views diverged considerably, and, not surprisingly, economics did not favour the MSc degree, but neither did engineering, which a few years later was also the last to agree to the PhD. The majority, however, favoured the MSc to be taken wholly by research, except in mathematics where at least a partial examination was considered advisable. The regulations for the new degree of MSc first appeared in the calendar for 1914/15[1] and from 1916 onwards all candidates for the DSc who had not been granted special dispensation were required to be Masters of Science.

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[1] Sir Henry Armstrong of City and Guilds College in a letter to Sir Arthur Rücker, Principal of the University of London, dated 23 November 1903; it came before the Senate on 27 July 1904.

[2] See London, University of (1905) p. 162.

So far as the MA was concerned, this had also become research orientated, at the time of the reconstitution of the University of London. New regulations introduced in 1902 postulated that 'the Examination for the MA degree in all subjects except Mathematics will include a thesis or other record of original work. ...' There was to be a viva voce as well as a substantial (though reduced) number of written papers. The period between the BA and the MA was extended from one to two years but the DLit regulations no longer insisted on a specific period of standing after the MA. This was, however, altered once again in 1914, when it was laid down that only Masters of Arts of five years' standing or of at least thirty years of age could present themselves for the DLit.

The arts faculty had thus, unwittingly, created a suitable gap between the MA and the DLit for yet another research degree — the PhD. On the other hand, with the creation of the MSc by research available only one to two years after the BSc, and the DSc within a similar period after that, the faculty of science must have found it very difficult to fit a PhD into its existing degree structure.[2]

Efforts to found an institution for scientific research in London

The development of a complex higher degree network for London in the early years of the twentieth century was clearly brought about by changing attitudes to the importance of postgraduate studies and led to new ideas on how these might be most effectively organized. As early as 1883, in his presidential address to the Biological Section of the British Association, Ray Lankester had called for research laboratories to be set up in the metropolis as part of a properly organized teaching university or else as an independent unit. 'It is one of the misfortunes and disgraces of London,' said Lankester, 'that alone amongst the capitals of Europe, with the exception of Constantinople, it is destitute of any institution corresponding to the universities and colleges of research which exist elsewhere.'[3]

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[1] At this point the external BSc by research was abolished and a compulsory non-research element introduced into the internal degree, no doubt to differentiate it more from the new MSc research degree.

[2] See below, pp. 156-7.

[3] Lankester (1883) p. 95.

Twenty years later, Sidney Webb, delighted at the creation at last of that real teaching university in London, also maintained that it was now her 'obvious and imperative duty ... to become the foremost postgraduate centre of the intellectual world.' What was required was 'a great development of post-graduate work, specialist teaching and original research.'[1]

Webb sat on a special sub-committee of the London County Council's Technical Education Board which was then about to issue a highly provocative report 'on the need and present provision for special training of an advanced kind in the application of science to industry'.[2] And it was no coincidence that it pointed to 'the lack of any institution providing advanced technological training which is sufficiently equipped and endowed to enable it to give adequate attention to post-graduate or advanced work. ...' Such an institution, forming part of the newly reconstituted University of London, would attract distinguished professors capable of supervising the work of postgraduate students in all branches of science and technology applicable to industry. And such work might well be rewarded by 'the degree of Doctor of Science, a distinction to which importance is attached.'

Even as the Board was deliberating on this report, London University's recently installed chancellor, Lord Rosebery, together with R.B. Haldane and others, was engaged in enlisting financial support from various industrialists for just such an institution. The response to the proposal for a 'London Charlottenburg', as it became known (after the German Technical University situated in the district of that name on the outskirts of Berlin), was positive, but both the LCC and the government, who would be financially involved, were anxious to relate it to existing bodies and avoid unnecessary duplication.

The Board of Education therefore set up a departmental committee 'to enquire into the present working of the Royal College of Science, including the Royal School of Mines' and to recommend measures to ensure their fullest utilization for the promotion of higher scientific studies in the future. Appointed in April 1904, it included among its members Sir Philip Magnus, Sir Arthur Rücker, Sidney Webb, and R.B. Haldane, who became its chairman when Sir Arthur Mowatt resigned after the first few months. Their chief recommendation was that the three colleges already existing on the South Kensington site, with additional departments as required, should together be reconstituted as an institution of science and technology, 'where the highest specialised instruction should be given and where the fullest equipment for the most advanced training and research should be provided in various branches of science, especially in its applications to industry', a formulation which found its way — word for word — into the charter of the newly created Imperial College of Science and Technology in 1907.[1]

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[1] Webb (1902) pp. 916 and 926.
[2] London County Council ... (1902).

The departmental committee had, however, been unable to agree on the thorny question of whether the new institution should be incorporated into London University, and a positive decision on this had to await the deliberations of the Royal Commission on University Education in London, set up under R.B. Haldane's chairmanship in 1909. This sat over a period of four years and covered a wide range of topics relating to the development of postgraduate education, such as the separation of undergraduate from postgraduate training and of teaching from research, the desirability of a change of university between undergraduate and postgraduate studies and similar problems which could be equally topical to-day.

Its recommendations, like those of similar commissions before them, were sufficiently coloured by the German example for biting tongues to wag at the 'attempted Germanisation of London University' by that 'graduate of Göttingen' (R.B. Haldane) and his colleagues.[2] They cited the Commission's praise for the 'German Seminar' and the use of Charlottenburg as the 'model' for Imperial College. There were allusions to the 'Prussian arrogance' with which these various 'teutonic proposals' had been made and — clearly — it was now the year 1914!

Manchester fellowships help to develop postgraduate study

Meanwhile, postgraduate education elsewhere in Britain had continued to grow and particularly so in Manchester, whose earlier efforts in this direction had been rewarded by the achievement of university status. Support for that venture had been generously given by Oxford historian Edward Freeman, whose library was later acquired for the new university by his Manchester colleague T.F. Tout; James Bryce and scientists Kelvin, Huxley and Brodie all played their part. Playfair had been a keen supporter and Sir Arthur Rücker, then Professor of Physics at Leeds, had added his weight to the arguments in favour of Manchester being granted university status. Her growing reputation in various fields of research also led her to attract funds for a number of postgraduate scholarships and fellowships which in turn boosted the research orientation of her staff and students.

The most important of these, the Bishop Berkeley Fellowships instituted in 1881, were likened by their anonymous donor[3] to those 'adopted at the Johns Hopkins University at Baltimore ... not as rewards for past work, but as aids and incentives to good work in the future ... for young men — original investigators in science and literature or in training for professorships'. He did not 'care to help on young men either for the church or for the law. Ninety-nine times in a hundred the world would be no poorer if they did fail.'[1]

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[1] For an interesting account of the birth of Imperial College see Linstead and Knott (1957).

[2] The Attempted Germanisation of London University (1914).

[3] Later revealed to be W. Seaton Brown (see Fiddes 1937 p. 116).

In the fifteen years of their existence, these two-year fellowships worth £100 a year were held by forty-three young researchers of whom a quarter were engaged in some field of arts while another quarter devoted themselves to chemistry, the remaining half being divided amongst the rest of the sciences.[2]

Of four other privately donated fellowships instituted around this time, two went to graduates of arts and two to scientists. By the turn of the century, the university itself was awarding four annual fellowships 'for the encouragement of study and research', as well as a number of honorary research fellowships and studentships which offered free use of university laboratories.

Like most other provincial universities which had evolved from local colleges, Manchester was undoubtedly science-orientated. During the first twenty years of its existence, three times as many students gained Honours degrees in science as in arts, but some of the arts teaching was remarkably modern and advanced. In this connection mention must be made of the work of T.F. Tout who, following on after Ward, ran Manchester's history department for thirty-five years. His immense vitality and enthusiasm and his recognition of the importance of training students in methods of research was to bear fruitful results, not only in the long series of competent historians whom he helped to develop, but also in the influence he exerted on his university's attitude to research in general.[3] Later, when the introduction of the PhD was being considered around the conference tables, Tout was one of its most effective protagonists.

In 1908, a few years after Manchester University had become fully independent, Tout surveyed its first 'Four years of Development'[4] and was delighted to be able to report on recent progress in what he regarded as 'even more important than the honours schools — the postgraduate and research work of a university. The true measure of academic progress,' he maintained, 'is the share which the university takes in the advancement of knowledge and the part which it plays in training its alumni in original investigation.'

Referring to those pioneers who already half a century before had endeavoured to instil Owens College with the spirit of research, he explained that only in quite recent years had the resources of the institution been sufficient for it to organize systematic research work on a large scale in more than just a few departments of natural science. The current calendar contained a gratifying list of no less than 177 'graduates and research students in residence'. He noted that besides Manchester, universities as diverse as Cambridge, Oxford, Berlin, Bombay, New Zealand, Wales, Leeds, Dublin, Edinburgh and Glasgow were represented among these graduates, who were mostly studying for higher degrees or special diplomas. But there was also a remarkable list of nearly sixty research fellows and students (including some university teachers of high standing from Germany, Japan and the United States) who were carrying on independent work in the university. More than a third of these were engaged in investigations in some branch of chemistry, the next largest numbers being concerned with physics and with public health, followed by history and botany. And, he concluded, 'to this must, of course, be added what is done by the staff towards the extension of Knowledge.'

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[1] Thompson (1886) p. 603.

[2] Philip Hartog, who himself held one of these fellowships, provides much useful information on these and other postgraduate fellowships at Manchester in his history of Owens College (see Hartog 1900).

[3] For a fuller account of Tout's work and role in the university, see Charlton (1951).

[4] Tout (1908).

Postgraduate studies develop at other provincial universities

Manchester's partners in the Victoria University, Liverpool and Leeds, were also developing their higher studies — if at a somewhat slower pace. Leeds was able to report as early as in 1882, that 'in the Dyehouse, Mr A.G. Perkin,[1] a student, has, in conjunction with the Instructor, worked out the first original research of the department, viz. the discovery of some interesting new colouring matters. ... A paper on the subject has been recently read before the Chemical Society of London.[2] While the description of this achievement may appear a little primitive, we know now that this same 'Dyehouse' was eventually to turn into one of the world's foremost university research centres in this field. And Leeds was also expanding rapidly in other areas. In the early eighties there were seven professors and ten assistants for 392 students; twenty years later, by 1911, the number of professors had risen to forty-one and of students had almost quadrupled.

Liverpool, with its early development of research in tropical medicine — the school had been founded in 1898 — soon gained world renown in this field. Moreover, in 1901-2, the year before it achieved independent university status, the college had fifteen 'postgraduate and research students', but by 1905-6 this figure had risen to 132.[3] This latter represented one in ten of its total student population; in Manchester it was nearer one in six. These figures might appear surprisingly high, but it must be added that many of the students were occasional, some of them being evening students, and the majority were not studying for a degree.

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[1] Son of W.H. Perkin, discoverer of analine dyes; A.G. Perkin became an FRS and was to teach at Leeds for 34 years.

[2] Draper (1912) p. 101.

[3] *Liverpool, the University College and the University of ...* (1907) p. 31.

Ramsay Muir believed that of all the changes which the foundation of Liverpool as an independent university had brought about, none was more striking than the increased emphasis on research. 'There is no single teacher, senior or junior,' he wrote, 'to whom it is not daily brought home that he does not deserve his position unless he is doing his best to enlarge the bounds of knowledge; that he cannot even be a good University teacher unless he is also perpetually a learner and an explorer. And when any new teacher is appointed, one of the principal questions always asked is the question: What original work has he done, and what is he likely to do? There is not a single department of the University in which original investigation is not being actively carried on. ...'[1]

Muir was looking at his beloved university through rose-coloured spectacles, but his remarks show clearly that it was becoming respectable — perhaps even 'the done thing' — to display a university's research work as one of its greatest assets.

Sir Oliver Lodge, first principal of the new University of Birmingham — aided no doubt by the galaxy of research protagonists around him (William Ashley, E.A. Sonnenschein and Joseph Chamberlain himself) — was thus able to put forward his scheme for raising the gigantic sum of £5 million for a great scientific centre at Birmingham, without being considered wildly eccentric. £1 million of this was 'intended for a real attempt at Scientific Research in all departments' and this 'would have to provide not only the necessary appliances and assistance but it would endow fellowships for postgraduate study and would attract workers from many parts of the world, and certainly from the Colonies.' In justifying this audacious proposal, he suggested that if only one individual out of a thousand were 'set free and encouraged by suitable surroundings for a few years of research' and if out of these only one in ten proved to be outstanding, then even the discoveries of that one 'select tenth would be of incalculable value. The world has been wasteful of genius hitherto. ...'[2]

While his centre remained a dream, Birmingham nevertheless attracted a sufficient volume of research endowment during the ensuing years to justify her remarkable leap from the rank of university college, newly acquired in 1897, to becoming, in 1900, the first of the new independent provincial universities.

Wales pioneers the MA by thesis

The 'first university movement' in Wales had resulted in the creation of the University College of Aberystwyth in 1872. This was followed eleven years later, in 1883, by a southern University College in Cardiff. Bangor in the north opened its doors the following year, and by this time the 'second university movement' — for freedom from London's degrees and for a wholly independent University of Wales — was gathering momentum.

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[1] Muir, R. (1907) p. 35.

[2] Sir Oliver Lodge, 'Survey of the Sciences' February 1902 (ED 24/1956, Public Record Office).

Sir Henry Jones, one of its most ardent champions, was convinced that Wales had to achieve this pinnacle of self-assertion — even if 'the degrees of the Welsh University must, like all other things, pass through a period of probation; and its first graduates, at the very outset of their practical career, will be placed under a certain disadvantage.'[1]

A pamphlet edited by Rhys Roberts, then Professor of Greek at Bangor, infused the struggle for a university for Wales with the spirit of research. In his introduction, after the inevitable survey of continental and American universities, some of which in contrast to Oxford and Cambridge he described as true places of 'learning', Rhys Roberts maintained that: 'One obvious conclusion to draw from the German experience is that, in constituting any new university, ample provision should be made from the start for attaching to it, as far as possible, its most promising graduates. This cannot be done in this country by simply allowing those graduates to teach and take the fees; students are too few and the cost of living is too high. University Fellowships or Scholarships will be required in addition. In connection with this and other points, it will be well to see what the American universities, the best of which gladly learn from those of Germany, have to teach us.'[2]

While stressing the absolute need for the three colleges to co-ordinate and maintain degrees of high quality, he declared that 'Unless there is every prospect of securing a high degree standard and advanced work — Wales would do well to wait for her university.'[3]

In 1893 Wales achieved full university status. Her newly found independence from London degrees and Rhys Roberts' stress on advanced work, soon led to the creation of a new type of Masters degree to be awarded to Welsh BAs who submitted a satisfactory dissertation after a year's research. Graduates of other universities, besides submitting the dissertation, had to have spent two years on studies culminating in the equivalent of a Welsh BA examination.

A unique feature of this MA degree — the regulations for which appeared for the first time in the 1898-99 calendar of the University of Wales — was that candidates had to choose a title for their dissertation from a list provided by the university, which altered little from year to year. Whilst this scheme may appear to have been unduly rigid, it will also have had the advantage of channelling students into topics for which adequate supervision was available.

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[1] In an address at the University College of Bangor in 1895. Quoted in Hetherington (1924) p. 96.

[2] Roberts, W. Rhys (1892) p. 13.

[3] Ibid. p. 19.

And so the University of Wales had instituted a bona fide MA by research several years ahead of London, and in fact before any other university in the United Kingdom.

ON THE THRESHOLD — GROWING POLITICAL PRESSURES ACCENTUATED BY THE WAR

And so the late nineteenth and early twentieth centuries saw the provision at most British universities of a modicum of facilities and higher qualifications for graduates wishing to study beyond their first degree. Oxford and Cambridge, emerging from their eighteenth-century lethargy, had gone some way towards bringing their undergraduate courses more closely into line with modern needs for specialization. The multiplication of schools and triposes, the hesitant acknowledgement of the value of science as a discipline in its own right and the lowering of the level of classical attainment hitherto demanded from all students, went some way in the required direction. Reluctantly the ancient universities had been moved to introduce some semblance of higher qualifications in what had hitherto been regarded as the 'non-professional' disciplines of science and letters.

The new provincial universities, unhampered by centuries of inertia, responded more readily to modern demands for advanced study and research. But, lacking the rich endowments of the ancient institutions, they were dependent on direct support from private benefactors or industry and from what small grants they could wring out of the state.

In the days of large successful family businesses with strong local ties of a social and economic nature, it was common for these wealthy families to give substantial sums for the construction of a new building or the endowment of a chair at their local university. Nor was their generosity purely motivated by expectations of direct scientific returns for their own concerns. Frequently these philanthropists were moved by a religious or social conscience — or perhaps the desire to receive a knighthood or a good name for their business.

While the research of university professors — especially in various branches of chemistry — frequently contributed to the progress of industry, the latter did not at that time envisage the employment of large numbers of university graduates, and certainly had no place for those trained beyond the first university degree. Industry may have been interested in the universities producing answers to their technological or scientific problems, since prior to the twentieth century their own research facilities were practically non-existent. But at this time they saw little point in employing older university-trained men in preference to young graduates or even school lads of fifteen or sixteen, whom they could 'bring up' themselves as apprentices.[1]

There was also, however, an increasing number of progressive industrialists and politicians who could see that if Britain were to maintain her place of economic and political superiority in the world — to keep pace with her rivals whose rapid progress in the second half of the nineteenth century had become a serious threat — she would have to develop her resources in brain power to the highest possible level. And while the fear of Britain becoming a second-rate nation led government and industry to pay greater attention to the development of postgraduate education, other factors were reinforcing that tendency.

The Allied Colonial Universities Conference of 1903 demands increased facilities for postgraduate studies

Britain was at the hub of a huge Empire then still at its peak. With the rapid development of communications, increasing numbers of colonial students were looking to her for the higher education which their own countries often lacked. Not only did white colonialists want their sons to study at home, but an increasing number of privileged 'natives' wished to educate their sons in Britain.

According to a report issued at the turn of the century, the United Kingdom was accommodating around forty overseas students on colonial government scholarships. The majority were at Edinburgh, a few at Oxford and Cambridge and a few more spread around various technical institutions. Mostly they studied medicine or law or engineering.[2] In 1902, however, with the introduction of the Rhodes scholarships, the number of colonial students at British universities suddenly trebled.

In response to a request from Professor Freemantle of Capetown,[3] a graduate of Oxford who was anxious to ensure that the opportunities opened up by the new scholarship scheme were used to best advantage, the Hebdomadal Council asked the Colonial Office to arrange for a delegation from Oxford to meet colonial representatives who were in London that summer for the coronation of Edward VII.

A meeting took place at the Colonial Office on 10 July 1902. Oxford was represented by its vice-chancellor and by T.H. Warren, D.E. Matheson, H.T. Gerrans and H.F. Pelham, all of whom were experienced in matters concerning overseas students and postgraduate studies and were also to be subsequently active on committees and at conferences dealing with these topics. The fourteen colonial delegates included Principal Peterson of McGill, who was to play a similarly important part at subsequent conferences of Empire universities, and W. Pember Reeves, then agent general for New Zealand, who was shortly to become director of the newly established London School of Economics. In the chair was the Earl of Onslow, Under-Secretary of State for the Colonies.

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[1] On industry's relationship to the universities at this time, see Sanderson (1972) Chapters 3 and 4.

[2] Colonial Office: Report of a Committee appointed to Consider Questions relating to the Position of Students holding Scholarships in the United Kingdom granted by Colonial Governments, 15 December 1899 (CO 885/6 No 126 Public Record Office).

[3] H.E.S. Freemantle to the Vice-Chancellor of the University of Oxford, letter dated 8 April 1902 (see Minutes of a Conference on Educational Questions, held at the Colonial Office, 10 July 1902, pp. 4-5. CO 885/8 No 147 Public Record Office).

It became clear during the discussions that the most beneficial utilization of the Rhodes scholarships would be for students who had already spent at least two years at their own universities before coming to Oxford. Principal Peterson, representing Canada and speaking also 'as the next-door neighbour of the United States of America', did not think that any general school education on the American continent leads naturally up to the University of Oxford.'[1]

Mr Pelham, president of Trinity College, Oxford, raised the 'pressing' question of the extent to which Oxford University could help those 'who wish to become students in the real sense — to undertake research'. He hoped that the closer connection between Oxford and the colonies brought about by the Rhodes scholarships would 'stimulate what I think we all wish to see — the attempt to organise in a more definite way what I call post-graduate studies.'[2]

A proposal by the chairman of the conference, that the Colonial Office might grant facilities for publication and distribution of information on facilities available at British and Empire universities, was received with applause. In the event, the first 'Handbook' of this type was not published until 1914 — and then not by the Colonial Office, but by the Universities Bureau of the British Empire.

A much less ambitious project was, however, realized almost immediately: the publication by Oxford (for distribution by the Colonial Office) of a short brochure addressed to colonial and Indian students, detailing the facilities open to them at the university. About a quarter of this was devoted to a section on 'Postgraduate Study and Higher Degrees'.[3]

But perhaps the most momentous result of this conference between representatives of Oxford and colonial universities was the impetus it gave towards the organization of a very much enlarged gathering that was held in London exactly twelve months later, in July 1903.

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[1] Ibid. p. 7.

[2] Ibid. pp. 9-10.

[3] For the original text see Memorandum relating to a Colonial Conference, 11 December 1902 (HC/M/3/18, University of Oxford Archives).

In November 1902, graduates of Trinity University, Toronto, held their first ever reunion outside Canada — in London. It took the form of a dinner, at which Sir Gilbert Parker, MP for Gravesend and himself a graduate of Trinity, proposed that a similar event be held the following summer, to be open to graduates of all colonial universities sojourning in Britain at the time.

An invitation sent out in February 1903 informed prospective guests that the dinner would be attended by 'some of the most distinguished men in the public life of Great Britain and the Empire.'[1] The response appears to have been overwhelming and Sir Gilbert Parker soon found himself involved in arranging a much bigger event than had originally been envisaged. Moreover, it was decided to hold a conference the day before the dinner, on 9 July 1903. The organizing committee consisted of Sir Gilbert Parker, R.B. Haldane, Sir Oliver Lodge, Sir Arthur Rücker, Sir Michael Foster and Herbert Warren of Oxford. Its honorary secretary was Clement Kinloch Cooke[2] of the Royal Empire Society. As might be expected from such a high-powered body, they were able to secure the attendance of many eminent men at the conference. Moreover, the relevance of this event for the future of postgraduate education in Britain is evident from the two resolutions which formed the basis of its deliberations:

> '1 That in the opinion of this Conference it is desirable that such relations should be established between the principal teaching Universities of the Empire as will secure that special or local advantages for study, and in particular for post-graduate study and research, be made as accessible as possible to students from all parts of the King's dominions.
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> 2 That a Council, consisting in part of representatives of British and Colonial Universities, be appointed to promote the objects set out in the previous resolution.'[3]

That the event also had considerable political significance for Britain's relations with the Empire may be deduced from the fact that the Prime Minister himself presided at the conference dinner. In his address,

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[1] Letter from Dr E.N. Féré and Dr L.C.R. Arnott, Honorary Secretaries, Allied Colonial Universities Dinner, to the heads of the Universities of the British Empire. A copy exists in the Archives of the University of Edinburgh, among papers relating to the Meeting of the Senatus Academicus of 14 February 1903.

[2] Two years before, in 1901, he had founded the journal *Empire Review*, of which he was to be editor for 40 years. He also became a Member of Parliament.

[3] Kinloch Cooke (1903) p. 69.

A.J. Balfour expressed the hope that improved postgraduate education would be one of the major practical results of the conference: 'It is our business to see that the students who desire it have it, and that the number of those who desire it is augmented so far as our influence will go.'[1]

The conference took place at Burlington House, headquarters of the Royal Society, whose president, Sir William Huggins, had only the year before devoted a considerable part of his presidential address to the need to introduce research into university studies to a much wider extent than had hitherto been the case. In the course of his brief remarks of welcome to the Allied Colonial Universities Conference he expressed the view, which he believed to be also that of the Royal Society, that it was 'of extreme importance that original research in some form or other should become a condition for receiving the higher academic degrees.'[2]

The first of the two sessions was presided over by the Right Honourable James Bryce, MP, FRS. An Oxford man through and through, Bryce had attained a First in LitHum, back in 1861. He had also been President of the Oxford Union. In 1870, when he was only thirty-three, Gladstone had appointed him to the Regius Chair of Civil Law, a post he only relinquished twenty-three years later, when his time-consuming activities as a Liberal MP prevented him from doing justice to the professorship. He chaired the Royal Commission on Secondary Schools in the nineties and travelled widely in the United States, to which he was soon to be assigned as Britain's Ambassador.

'It is impossible ... to exaggerate the importance of postgraduate courses,' Bryce told the delegates, 'a side of university work which is still imperfectly developed among us here in Britain, and which, I hope, will receive further and further development in years to come. For the last twenty years, ever since I had occasion to know how many American students were flocking to German universities, to obtain here the advanced teaching which Oxford and Cambridge did not provide, I have been endeavouring to call the attention of my own university to this branch of work.[3] If we in this Conference can do anything to induce the British Universities to go much farther than they have yet done in the way of making provision for post-graduate courses, and for carrying special students to the highest point to which we can carry them, we shall render a considerable service both to ourselves and to the universities.'[4]

Bryce also gave a clear indication of the political motives behind the government's support for the conference when he suggested that co-operation and intermingling between the universities of the Empire and

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[1] Ibid. p. 123.
[2] Ibid. p. 77.
[3] See below, pp. 119-20.
[4] Kinloch Cooke (1903) pp. 74-75.

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Britain 'will help us as, perhaps, scarcely anything else could do to follow the movements of public opinion in those regions, and to create what I may call a common public opinion of the British people, a public opinion which will occupy itself with questions that are common to us all.'[1]

Delegates who spoke at the conference included Sir Arthur Rücker, and Mr T.H. Warren (pro-vice-chancellor of Oxford), Lord Kelvin, Sir William Ramsay and other British university men. Ernest Rutherford attended as a delegate from McGill where he was teaching at the time; he was accompanied by that university's principal, Peterson, and Lord Strathcona.

Sir Oliver Lodge, principal of Birmingham, spoke strongly in favour of free interchange of students between universities for purposes of postgraduate studies and advanced specialization. This would also involve mutual recognition of first degree qualifications. 'I do not think that we need be too squeamish about it', he said, 'it is the best students who wish to make greater progress and to reach a higher stage. We all have duffers whom we sometimes pass through whom we feel we ought not to pass through — but these will not want to go on; we shall not trouble universities with them.'[2]

There was talk of specialization at particular universities of the empire so that with free movement between them students could congregate at one or another, according to their specialism. R.B. Haldane suggested that a valuable result of the conference might be the application of this principle to the 'development of post-graduate research — because,' he believed, 'this would cut at the very root of the deficiency of British education.'[3]

The two resolutions were passed unanimously and it was also agreed to set up a Bureau of Information on university work throughout the empire. A large committee was appointed to establish an Imperial Universities Council to implement the decisions taken. But despite the enthusiasm of the conference, this council, made up of distinguished university men, remained ineffective, and its organizing secretary, Sir Gilbert Parker, lamented on a future occasion that he had found it extremely difficult to develop the practical side of the work due to lack of time and money.[4]

A.J. Balfour on the unique role of postgraduate work in the universities

It was therefore not the Imperial Universities Council, but the League of the Empire, which called the next conference at which representatives of Empire universities had the opportunity of discussing closer co-operation. There was some continuity here, in that Sir Gilbert Parker, among his numerous offices, also held that of vice-president of the League and many of those who had attended the 1903 conference were also present at the

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[1] Ibid. p. 76.
[2] Ibid. p. 91.
[3] Ibid. pp. 118-119.
[4] See League of the Empire (1908) pp. 165-6.

League's Federal Conference on Education in 1907. As might be expected, therefore, at those sessions dealing with the universities, a considerable part of the discussion centred around the subject of postgraduate studies. Indeed, according to the agenda, a session on 'University Co-operation', was intended to consider 'the best means of drawing together the Universities of the Empire through postgraduate research.' During the course of this, A.J. Balfour as chancellor of the University of Edinburgh, addressed the conference on the subject of 'Higher Education and Research'.

Balfour spoke of the crippling effect of the universities' examination system under which 'it would almost seem as if the highest work of our universities consisted in a perennial contest between the examiner on the one side and the coach on the other, over the passive body of the examinee. ... But at all events,' he continued, 'let us rejoice in common that there is one branch of university work, of growing interest and importance, daily receiving more recognition from all that is best in the intellectual life of the country — I mean the postgraduate course. ...' And it is in this connection 'that there can be a kind of co-operation between us and the more distant parts of the Empire, which is impossible with regard to the earlier and lower stages of university culture. ... I earnestly hope that one of the outcomes of this Conference, and certainly the outcome in which I take the greatest interest, will be such a development in the post-graduate system.'[1]

And Balfour sensed correctly that it was this which was to have a more unifying effect on the universities than any factors relating to undergraduate education. The experience of the past few years had already pointed in this direction. The Association of American Universities had been founded on the basis of common interests in the field of postgraduate education. One of the principal purposes of the Allied Colonial Universities Conference of 1903 had been the facilitating of postgraduate studies between universities of the empire. And now, at this 1907 conference, the same discussion was continued. The next conference, to be called in 1912, was again to give this question an important place on its agenda. It would appear, in fact, that at this time any university conference of a national or international nature inevitably found itself discussing postgraduate studies; and — as will be seen — it was the provision of facilities for postgraduate studies and the introduction of the PhD which finally brought together the universities of the United Kingdom in a permanent body for consultation and co-operation.

The first Universities Congress of the British Empire in 1912 formulates the demand for a lower doctorate

In November 1909, the Senate of the University of London took a fresh initiative when it resolved 'that it was desirable to hold an Imperial

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[1] Ibid. pp. 99-101.

Universities Congress in London.' With the concurrence of Oxford and Cambridge, its principal, Sir Henry Miers, sent out invitations to all United Kingdom universities to join a committee to organize the congress. The Board of Education, Colonial Office and India Office were also represented, and the committee first met in November 1910 when it drafted an agenda for the Imperial congress to be held in 1912. Preliminary meetings to discuss the agenda were held in Canada, Australia and India. These, along with the Home Universities Committee meeting in London, constituted an important step forward in university co-operation in each of these countries, which in turn enhanced the effectiveness of the decisions reached by the congress.

This turned out to be a huge representative gathering which involved almost all the leading personalities in university politics in Britain and the Dominions, including the Marquess of Crewe, Lord Curzon of Kedleston, Viscount Haldane, Lord Rayleigh, A.J. Balfour, Sir Gilbert Parker and Sir Clement Kinloch Cooke. There were Sir William Bragg, then of Leeds, Sir Oliver Lodge from Birmingham, A.E. Shipley for Cambridge, Dr W.H. Hadow of Armstrong College, Newcastle, Sir Donald MacAlister of Glasgow, Michael Sadler who by then was vice-chancellor of Leeds, W. Peterson of McGill and Ernest Rutherford, now back in England and representing Manchester. Gilbert Murray, Sidney Ball and H.T. Gerrans came from Oxford and Robert Falconer from Toronto. Also present were Sir Arthur Schuster and J.J. Thomson, P.J. Hartog, G.R. Parkin, Albert Mansbridge, Sir Henry Roscoe, Sir Arthur Rücker, L.A. Selby Bigge from the Board of Education, and many more.

All of these at one time or another played an important part in furthering the cause of postgraduate education and this topic was to hold the attention of the congress for a considerable proportion of its time. One long session was devoted to 'Inter-University Arrangements for Post-graduate and Research Students, including the Questions of Reciprocal Recognition of Courses for Post-graduate Degrees; Co-operation in Post-graduate courses and Specialization in Postgraduate courses along special Lines among Universities.'

As it had been the express desire of the Canadian universities that this topic should be fully discussed at the London congress, it was fitting that Principal Peterson of McGill was invited to open this session. After surveying the facilities for postgraduate education in the States, Canada and Britain, Peterson expanded on what the Canadians clearly considered to be a burning issue, namely the increase in facilities for postgraduate study and the provision of effective higher degrees in the universities of the United Kingdom.

He pointed out that 'both from the University and the imperial points of view, it was of supreme importance that something should be done without delay to divert the stream of able Canadian students from America and Germany into the United Kingdom. ... If one wanted to raise a concrete issue, one might be bold enough to ask why the English universities should not start the PhD degree, mainly in the interest of advanced students from other institutions? ...' The DLitt and the DSc were 'not, as a rule, within the reach of the average student ... from an American university, who goes over to Europe to specialise for two or three years at most.'

But, Peterson warned, 'we ought not to make a fetish of the PhD. Its popularity in the United States is too intimately connected with financial value.' Yet, he added, 'I cannot help thinking that it would be comparatively easy to provide against this danger at Oxford and Cambridge, which have been so successful in safeguarding undergraduate college education in its present form, and where the interests of truth and knowledge are not likely to be unduly affected by the atmosphere of an employment bureau or an agency for securing teaching appointments.' [1]

Supporting Peterson, Professor Frank Allen of Manitoba insisted that if a suitable higher degree were 'not forthcoming, the students will not be forthcoming. You may say what you like about the commercialisation of the degree or the lowering of the aim in obtaining it, but these are the facts.'[2]

Representatives from Melbourne and Calcutta pleaded strongly that first degrees from colonial universities should be recognized by United Kingdom universities as equivalent to their own Bachelors degree, so that overseas students could proceed directly to a course of advanced study or research.

While the congress passed no formal resolutions, it ended on a note of hope that a further congress would be held in 1917. World events overtook this decision and the next Imperial Universities Congress did not take place until 1921. It had, however, also been decided to set up a Central Bureau of Co-ordination and Information and this did make some considerable progress, despite the outbreak of war.

The birth of the Universities Bureau of the British Empire

The setting up of such a seemingly harmless yet useful organization might be expected to have been a relatively smooth operation. Yet even such a mild degree of co-operation was seen by some to carry with it the threat of a loss of independence. There were serious misgivings in some quarters, and it only came about after one of those behind-the-scenes manoeuvrings, so peculiar to the British universities.

The organizing secretary of the 1912 congress, Dr R.D. Roberts, had died in 1911 and was succeeded by Dr Alex Hill, sometime master of Downing College and vice-chancellor of Cambridge and currently principal of Hartley College, Southampton, who also agreed to act as honorary secretary of the proposed bureau. In October 1912 the universities received an invitation to be represented on the Bureau's formative committee. Hill's communication also hinted that the new organization would be requiring some financial support.

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[1] Hill, Alex (1912) pp. 37-39.
[2] Ibid. p. 58.

By the date of its first meeting, on 23 January 1913, almost all the universities had agreed to send representatives. The vice-chancellor of Manchester, Sir Alfred Hopkinson, had, however, voiced some misgivings. In a letter to Sadler of Leeds, he wrote: 'I have been talking to Dale [vice-chancellor of Liverpool] on this subject I think most of us in the North feel that you would be much the best representative for us on this Bureau. As you know, I have always felt considerable doubt as to the desirability of establishing it at all but in view of the strong feeling of the Colonials I did not wish to press any objections, and I think, as the Bureau is to be established, we ought to be strongly represented. I feel sure that our University would share the view expressed by Liverpool that it is essential to make it clear from the beginning that the Bureau has no controlling or directing power but is only for the purpose of collecting and giving information.'[1]

Edinburgh showed considerable reluctance and delayed contributing to the Bureau's funds while she repeatedly asked for more details of its work. Only after prolonged correspondence over more than fifteen months did she finally agree to contribute £25.

Oxford, too, was not without her suspicions, but readily agreed to send H.T. Gerrans as her representative to the Bureau. As a precautionary measure she set up a committee to consider the new organization's function and prospects and to confer with the Council of the Senate at Cambridge on the advisability of giving it long-term support. In the event, that committee reported favourably and Oxford's curator of the Chest reluctantly agreed to its suggestion that Oxford should guarantee £25 a year for the next four years 'because [the Council] cannot with propriety be advised to stand aloof.'[2]

Sadler of Leeds received letters from the vice-chancellors of Liverpool and Birmingham and the registrars of Manchester and Sheffield. Lodge of Birmingham reported that his university did 'not feel inclined to subscribe but would value a statement as to what your university is doing. ...'[3] 'Will Leeds support the Universities Bureau?' wrote Sir Alfred Dale of Liverpool. 'You may remember I disliked the plan at the outset, feeling that a centre of information is apt to develop into a centre of authority.

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[1] Alfred Hopkinson to M.E. Sadler, letter dated 30 October 1912 (UBBE, 1910-23, University of Leeds Archives).

[2] See Hebdomadal Council Papers, October 1912-1915, University of Oxford, Archives.

[3] Sir Oliver Lodge to M.E. Salder, letter dated 25 March 1914 (UBBE 1910-23, University of Leeds Archives).

You were less suspicious — certainly less unfriendly — than I was. If you still believe in the plan, to what figure does your belief run?'[1]

Writing to Oliver Lodge, Dale was more specific: 'If London gets things into its own hands, we may suffer in consequence. The whole plan is on an abundantly large scale. We shall certainly not contribute £50 a year or anything like it. My own inclination is to stand out altogether, and I shall try to get Leeds, Manchester and Sheffield to take the same line. If we contribute at all, it will not be more than £10 but I hope to avoid even this. ..."[2]

Dale was always outspoken and could hardly be regarded as a pioneer in university co-operation, though some years later he came to recognize the valuable role that the Bureau was playing in university politics.[3]

Even the gentle and wise vice-chancellor of Leeds himself, Michael Sadler, commented in a letter to the vice-chancellor of Manchester that 'the Bureau will evidently be much more useful to the Colonial Universities than to the English, and it is reasonable that the colonial contribution should be on a larger scale than ours. On the other hand, I feel that we ought to stand in with the business, if only on the ground that the information given by the Bureau would be advantageous to members of the staff, and especially to the junior staff, as it gives them an opportunity of getting early information about vacancies in overseas universities. I have felt that the estimated cost of working the Bureau went a good deal beyond the figure that I should have thought really necessary in the circumstances. I do not think that our Council here would be able in any case, to make a contribution of more than £10 a year, and even this sum may be objected to.'[4]

In the event, all these universities reluctantly contributed £5 to £10 a year to the Bureau, but the suspicions surrounding this first real attempt at university co-ordination continued for some time.

At its first meeting the Bureau committee, under the chairmanship of Sir Donald MacAlister, decided on the publication of a year book for which it would collect information, among other things, on the practice and requirements of universities regarding such matters as the conditions of admission of advanced students, regulations for higher degrees, research work and interchange of students, etc.[1] The first *Year Book of the Universities of the British Empire* appeared in 1914 and, with some interruptions due to war time exigencies, has to this day been maintained as an annual publication serving as a uniquely comprehensive reference book on British and Commonwealth universities.

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[1] Alfred Dale to Michael Sadler, letter dated 4 March 1914 (UBBE 1910-23, University of Leeds Archives).

[2] Sir Alfred Dale to Sir Oliver Lodge, letter dated 6 April 1914 (14 II 2, VC Correspondence, Sir Oliver Lodge, University of Birmingham Archives).

[3] At a Bureau conference in May 1919, Sir Alfred has this to say: 'Since the first establishment of the Bureau the whole sentiment of the Universities towards it has changed. They now recognize the necessity for an organization capable of promoting co-operation and speaking for the Universities as a whole' (Hill 1921 p. 439).

[4] M.E. Sadler to the Registrar of the University of Manchester, letter dated 17 March 1914 (UBBE 1910-23, University of Leeds Archives).

While the war might well be thought to have curtailed, if not completely paralysed, the new organization's activities, in fact it had a very different effect, casting upon it a much more important role than had previously been envisaged. For despite the reluctance of the universities the co-operate on a long-term basis, the circumstances of the war forced them to evolve a common attitude on certain questions — at least vis-à-vis the universities of other countries, whether allied or neutral or even those of the enemy. Moreover the government, always sensitive in its dealings with the universities and not wishing to be seen to 'interfere with their freedoms', became increasingly frustrated by the lack of a representative British university body with whom it could confer.

And this is where the Bureau began to play a most important role — as agent and correspondent between British universities and their foreign and colonial counterparts, as well as the government. The furtherance of postgraduate education in Britain and the development of research degrees, culminating in the introduction of the PhD, were an integral part of these activities.

The war accelerates the drive towards organized postgraduate education

Why was it then that the war actually accelerated the movement for organized postgraduate education in Britain? The universities were greatly depleted and men were dying in their millions on the battlefields of Europe; no one could look ahead for more than a few weeks at a time and every ounce of energy was demanded for the immediate task in hand — why was it that at such a time the universities, and also the government, became increasingly concerned with the development of facilities for postgraduate study?

During the previous half century the most important factor impelling the demand for increased research facilities and training had been the ever mounting economic ascendency of Britain's trade rivals, whose superior education systems provided them with large reserves of specialists trained to the highest level. An integral part of this demand was therefore directed towards raising the natural and physical sciences from their cinderella position throughout the education system to the important place that modern technology demanded.

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[1] See letter from Alex Hill to the Registrar of the University of Leeds, dated 26 February 1913 (UBBE 1910-23, University of Leeds Archives).

Other contributory factors which forced the universities to revise their attitude towards the provision of graduate education were the increasing demands for such facilities from the Empire and a growing recognition of the political wisdom of diverting at least a proportion of the migrant American graduates from their customary academic shrines in Germany, and affording them a taste of the British way of life. It was also becoming increasingly clear that to satisfy colonial students and to attract Americans, a good deal more would have to be provided than the minimal half-hearted concessions that research-minded academics had so far been able to wring from their reluctant colleagues.

With the advent of the war, these factors became greatly accentuated. While trade rivalry was temporarily removed from the agenda, Britain's sudden need to become totally self-reliant, exposed more than ever before the short-sightedness of past British governments and of universities, in relation to science and technology, research and specialization. Due to her long history of neglect of pure and applied scientific research, Britain had increasingly come to rely upon other countries, and ironically Germany in particular, for many vital products which now, during the war, she needed more than ever. Cut off from these imports, at last the realities of the situation had to be faced: the country's ignorance was costing it a great deal more than its education!

The first sign of the government's realization of this was the publication of a White Paper announcing a 'Scheme for the Organisation and Development of Scientific and Industrial Research.'[1] At last it was prepared to take direct responsibility in the encouragement and financing of research and the training of research workers. Amongst other things, the scheme embodied the creation of postgraduate scholarships and fellowships and the establishment of an Advisory Council for Scientific Research. Three years later, in 1918, after considerable resistance on the part of the Treasury, a new department was set up — the DSIR. No doubt this further step was to some degree prompted by the various pressure groups whose accelerated activities at this time were bound to receive attention in government circles as well as universities.

The setting up of the advisory council had clearly not allayed the concern of the science politicians. While they welcomed it as a partial realization of the national scientific council which they had long been wanting to see established, they also knew that a much more basic operation was required.

Thus only a few months after the publication of the government's White Paper, a group of eminent scientists issued a Memorandum on the Neglect of Science, which received considerable publicity.[1] Asking for 'immediate attention and drastic action', it maintained that not only were Britain's 'highest Ministers of State ignorant of science, but the same defect runs through almost all the public departments of the Civil Service. It is nearly universal in the House of Commons, and is shared by the general public, including a large proportion of those engaged in industrial and commercial enterprise. ...

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[1] Board of Education (1915).

'In the whole history of British Governments there has been only one Cabinet Minister who was a trained professional man of science — the late Lord Playfair. ... At Cambridge but four colleges are presided over by men of scientific training; at Oxford not one. Of the 35 largest and best known public schools, 34 have classical men as headmasters. Science holds no place in the list.' Ignorance had led government officials to make disastrous mistakes. Science must become a serious compulsory component in Civil Service and Army examinations and this in turn would help to bring about the desired change in attitude in schools and universities.

The signatories to the document included Henry Armstrong, Ray Lankester, Sir William Osler, W.H. Perkin (junior), E.B. Poulton, Sir William Ramsay, Lord Rayleigh, Arthur Shipley, Sir Edward Thorpe and Sir William Tilden. Before the summer of that year they called a conference, the response to which was so great that the room booked at the headquarters of the Linnean Society could not hold all who wished to attend.[2] Its outcome was a strong recommendation for natural sciences to become an integral part of school education and of entrance examinations to all universities, with the government giving a lead by allotting them an important position in all competitive examinations for the Home and Indian Civil Service and for Sandhurst.

Whether or not it was as a direct result of this conference, it is interesting to note that one of its strong supporters, Sir J.J. Thomson, was later that year appointed chairman of a new government committee to inquire into 'The Position of Natural Science in the Educational System of Great Britain.'

The report of this committee of inquiry, published in 1918,[3] included a section on 'Degrees for Research Work' in which it pointed to the confusion in nomenclature of existing research degrees and suggested that 'if the number of students who come to this country for advanced work increases, the need for a uniform and comprehensible system of research degrees will become even greater than it is at present.' While it favoured the retention of the DSc, it did not regard this degree, which required a maturer mind and at most universities a long period of study, as a suitable encouragement for young research students. It therefore supported the introduction of the PhD which was by then under serious consideration.

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[1] The Neglect of Science (1916a).

[2] It took place on 3 May 1916, and a Report of the Proceedings entitled *The Neglect of Science* (1916b) was published in London later that year.

[3] Committee to Inquire into ... (1918).

And so the urgent needs of the war led to an intensification of the struggle for the recognition of science which in turn resulted in a greater appreciation of the need for properly organized postgraduate research schemes leading to suitable qualifications.

The war too, had brought home to Britain her dependence on the Empire, not only for her wealth but also for the protection of that wealth. This in turn revealed the urgent need to ensure that the Empire's loyalty could be depended upon. And what better way to further that object than that future leaders of government and industry in the dominions should taste the British way of life by being trained alongside her own future leaders — in her universities. Rhodes had pointed the way. And now, when their allegiance counted for so much, the dominions' own pleas for the mother country to provide facilities for their graduates were bound to receive a sympathetic hearing — especially at a time when hundreds of thousands of Canadians, Australians, South Africans and Indians were fighting in France and — if they were fortunate enough to survive — coming 'home' on leave to England.

Political propaganda — an important by-product of student migration

And finally there was the purely economic and political interest which always impels the ruling class of one country to try to influence that of another in its favour. This, no doubt as much as any other factor, accounted for the British government's increasing concern that postgraduate education in British universities be made more attractive to foreigners.

University studies are normally undertaken during the chief formative period, and the ideological impact of their student days is well known for affecting people's attitudes for the rest of their lives. A very important and generally accepted aspect of student migration is therefore the cultural influence exerted on them by the host country, from which it later reaps considerable economic and political benefits. That Britain had up to that time been slow to recognize this is all the more surprising since she deliberately drew her own national leaders almost exclusively from the highly élitist universities of Oxford and Cambridge.

Foreign students, especially those who are already graduates of their own universities and go abroad to study at a higher, more specialized level, are likely to take back home with them long-lasting friendships and contacts from the host country; they will assimilate ideas, and attitudes and a certain loyalty to and interest in that country; they will have acquired a valuable training and know-how which in itself will enhance their authority when they return home. If their field of studies happens to be in classics or history, they are likely to widen the market for books and other cultural exports from that country. If, on the other hand, they are scientists or technologists, all the more are they likely to carry back with their newly acquired knowledge a built-in demand for the scientific equipment and instruments that they have come to know and use in the course of their studies.

One of the best examples of the country taking conscious advantage of the gains to be derived from exporting education is the American handling of the Boxer indemnity. Occurring at this very time, it opened the eyes of some British academics and businessmen to the political benefits to be derived from such activities.

The indemnity that the Chinese were paying to more than a dozen countries for the damage incurred in the rebellion of 1900 amounted to some £67 million. Apparently the United States, having found that it had greatly 'over-estimated' the losses it incurred during the rising,[1] decided to reduce the debt to a third of the original sum, on condition that in return a certain number of Chinese students should be sent to the United States for their education. The Americans were very active inside China too, it being estimated that in 1918 approximately '70% of the whole foreign education of China' was 'in their hands.'[2]

An American education administrator reported that, with the development of this activity after World War I, at times as many as 2,000 Chinese students were resident in the United States. He maintained that these mostly returned to their country 'firm friends of the U.S.' and indeed, when he visited China in 1925, he found that six of the ten members of the Chinese Cabinet had studied at American universities.[3]

Throughout this period and well into the twenties, much correspondence on this subject appeared on the files of the Foreign Office. Consuls and chambers of commerce and missionaries and educationists pointed out America's farsightedness in this field. Some expressed their delight that the Americans were doing this important job for us, others despairingly begged that Britain should similarly use her share of the Boxer indemnity and gain direct advantages for herself. But the tight-fisted Treasury would not be moved.

Nor was Germany herself unaware of the benefits she derived from her hospitality to foreign graduates. When in 1913, due to increasing overcrowding in the German universities, restrictions were imposed on the admission of foreign students, Dr von Salvisberg, editor of the German

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[1] Foreign Office, the Clive Memorandum on the Boxer Indemnity, August 1912 (FO 371/5326, Public Record Office).

[2] Foreign Office, Memorandum from Sir J. Jordan in Peking to A.J. Balfour entitled 'Educational Institutions in China', dated 23 July 1918 (FO 371/5326, Public Record Office).

[3] Duggan (1944) p.319.

Hochschul-nachrichten warned that 'following upon our most recent regulations to restrict the immigration of foreign students, there is a noticeable influx from eastern countries to the Swiss and Austrian universities. ... But we are also driving these students into the arms of other, more dangerous competitors on the world market and in international politics. Particularly France and North America, for whom, until now, the German universities have always represented the classic model of what a university should be. ... France has already around 8,000 foreign students which is 20% of their total, as against just under 5,000 (8.1%) in Germany, while the smart American is investing his Boxer millions directly in foreign students and has thus turned thousands of Chinese graduates into ready-made exportable pioneers of American culture.'[1]

But Germany had accumulated a great store of goodwill among Americans who for more than a century had found a warm welcome in her universities. Indeed, some of the German propaganda — especially in the early days of the war — was overtly directed at American university men who had formerly studied in Germany. According to a report in *The Times Educational Supplement*, 'hundreds of ostensibly private letters were received by ex-students of German universities addressed to them by their old German acquaintances and professors, recalling the pleasant days spent in the Fatherland and putting forward all the usual arguments in favour of the violation of Belgium and the beginning of the war.'[2]

During this period of America's neutrality, each belligerent would naturally endeavour to persuade this great uncommitted power to join their side. But while Germany was openly, and often crudely, thrusting its propaganda on by no means unwilling ears, Britain would seem to have been very slow to combat this onslaught, at least judging by the continuous stream of suggestions and criticism that came pouring into the country in letters from British nationals in America to their friends in Britain. Complaints about the deficiency of British propaganda were also voiced in the press and it was one such newspaper report, of an interview with the poet Alfred Noyes, who had recently completed an extensive lecture tour in the States, that sparked off a whole series of events, in the unpredictable way that such public outbursts are sometimes wont to do.[3]

Noyes said nothing very new, but what he said came at the right moment — when the appropriate authorities were feeling somewhat vulnerable and apprehensive. He maintained that current estimations of pro-German feeling in the States were grossly exaggerated except in one particular field — in which Britain was failing to use her opportunities — and that was education. 'The enormous educational machine in America, which is so much more important than anything of the same kind we have in Europe, is almost entirely run from Germany. A very large proportion of the staffs of the colleges and Universities has received all its educational training, or at any rate its postgraduate training, in Germany.

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[1] Salvisberg (1913) pp. 9-10 (translated by R. Simpson).
[2] American Students at British Universities (1919).
[3] Noyes (1916).

'I do not think people here quite realise what is going on in the educational life of America,' commented Noyes. 'Every State has its own University besides all the other colleges and Universities and many are larger than Oxford and Cambridge. ... These Universities are turning out thousands of students every year on a certain system, and this system in the great majority of cases emanates from Germany. It is perfectly obvious, if the system is allowed to continue, what a tremendous factor that may be in the future of the United States. ... The feeling in America is that we have held aloof in educational facilities, and this feeling really accounts for a good deal of anti-English bias. Although we have not intended it, the impression has been given in America that we are chiefly concerned about preserving our traditions for our own purposes.

'Now, without damaging our traditions, something could surely be done to attract Americans to our Universities. One can understand men going for scientific purposes to Germany, but there is something radically wrong when they go there ... to receive their training in English literature. ...' One of the main obstacles to American graduates who want to do their postgraduate work at British universities was that the latter did not recognize the work they had already done for their first degrees. 'Surely it ought not to be difficult to devise some special scheme which would meet their case. ...'

The Foreign Office steps in

Within two days, Mr Noyes's views had caused sufficient flurry at the Foreign Office for a new file to be opened under the heading 'German educational influence in America.'[1]

The first lengthy comment on the Noyes interview came from G. Butler, who felt that Mr Noyes underestimated what Oxford and Cambridge were already doing for postgraduate students. The trouble lay in a lack of communication. Many American graduate students never arrived at English universities, because they were uninformed of the opportunities available to them. 'I have seen the following often occur in many forms' wrote Mr Butler: 'An American College "President" (a very important person over there) anxious to find out the opportunities open for his pupils in an English University will take the trouble to write to, let us say, the "President" of Oxford University, asking him to "mail the College Catalog". There being no "President" and the University not existing as a unit for this purpose in England as apart from the Colleges, the letter is probably opened by an underling who is either puzzled by the request or derisive of the spelling and anyway returns either no, or an evasive answer. The American College President is offended and the mischief is done.'[1]

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[1] Foreign Office, German Educational influence in America (FO 395/11, Public Record Office).

He did not think that elaborate machinery was required to set into motion a better system of communication. The secretary of state, Butler suggested, could direct a letter to the heads of *all* British universities; for in some fields, especially of postgraduate education, which was what Americans particularly required, Oxford and Cambridge had rivals, eg Professor Tout's School of Historical Research at Manchester, Sheffield's engineering school and so on. He should explain the problems relating to prospective American students and urge the universities to give more publicity in the States to the facilities currently available to them.

Stephen Gaselee, also a Cambridge man, while agreeing with Butler, suggested that it might be advisable for the Foreign Office not to become too openly involved in this whole matter and that it could be 'equally efficacious if the letter came from a small but strong Committee, perhaps headed by Lord Bryce.'[2] This was evidently considered a good suggestion and taken up in subsequent minutes on the file. Lord Bryce had repeatedly visited the United States and had been Britain's Ambassador there up to 1912. The recently published second edition of his comprehensive work on America included two new long chapters on her universities.[3]

But before the Foreign Office brought in Lord Bryce to advise on those matters, Lord Curzon, chancellor of the University of Oxford and Lord Privy Seal, was asked for his comments. Adopting a highly critical attitude, but saying that he could speak only for Oxford, he proceeded to correct the impression given by Mr Butler, assuring him that 'any letter addressed to the head of the University, under however grotesque a title, reaches the Chancellor or the Vice-Chancellor; and a printed pamphlet about the post-graduate courses is sent in reply.'[4]

He felt that the real difficulty had not yet been touched upon. It arose from the very low standard of education that prevailed in almost all American universities, except a few such as Harvard. The American graduate who came to Britain was therefore in many cases not competent to pursue a research course, while 'the German University which gives a degree of PhD in return for a thesis only, is the happy hunting ground of these uneducated people.'[4]

Lord Curzon then explained that Oxford had for some time been considering a scheme for attracting American students in increasing numbers after the war. It was too early to make a public pronouncement on the subject but when they were ready, it would be most desirable to do so, 'not in reply to a letter from the Foreign Secretary, nor in a letter to the Universities from him, nor in a letter from a Committee, however influential — but in a statement emanating from the Chancellor of the University, to which the attention of the American Government might then be called by the Foreign Office, where Lord Bryce's influence would be invaluable in bringing it to the notice of his many American friends.'[1]

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[1] Minute dated 2 July 1916 (Ibid.)

[2] Minute dated 10 July 1916 (Ibid.)

[3] Bryce (1914).

[4] A four-page hand-written note signed 'Curzon of Kedleston' and dated 28 August 1916. (FO 395/11 Public Record Office).

It would appear that the Foreign Office staff were not over-impressed by Lord Curzon's suggestion that everything should wait upon Oxford's public pronouncement: 'If it is really desired to get anything done by the other Universities in this matter,' wrote Mr Butler,[2] 'I venture to suggest that the policy most likely to be successful is not to wait for action till Oxford has come out with a cut and dried plan and its Chancellor has made a public statement but either to have a joint consideration of the question by representatives of the older or all the universities, or far better still for the Committee suggested (with Cambridge men like Lord Crewe upon it if he is good enough to consent) to suggest to all the Universities that it is a problem worth considering and that each University will prefer and is best able to find methods to solve the problems in its own way.'[3]

'The Universities other than Oxford may not quite see why they should wait on Oxford in this or any other matter' wrote another 'correspondent'.[4]

On 21 September 1916, an approach was therefore made to Lord Bryce, which resulted in the Foreign Office receiving a comprehensive and well-reasoned memorandum on the question of attracting American students to Britain.[5] As Bryce pointed out, it was not a new one to him: as early as 1884, after a prolonged visit to the States, he had made representations 'to the highest authorities in Oxford, including the late Mr Jowett (who was then, I think, Vice-Chancellor), urging that if the University would provide post-graduate courses, (which there were plenty of professors qualified to give), it might expect before long a large afflux of students from the United States and some also from the greater British Colonies. Neither then, however, nor when I brought forward the matter again ten years later did anyone show interest in the suggestion.'[1]

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[1] Ibid.

[2] Geoffrey Butler, later Sir Geoffrey, very much a Cambridge man, was on wartime secondment to the Foreign Office. Past president of the Union and editor of the *Cambridge Review*, he was a fellow of Corpus Christi and later became MP for the University of Cambridge; he also became the first secretary of the Board of Research Studies at Cambridge in 1920.

[3] Minute dated 29 August 1916 (FO 395/11, Public Record Office).

[4] Minute dated 1 September 1916 (Ibid.).

[5] 'As to American Students at British Universities.' Memorandum by Lord Bryce, dated 31 October 1916 (Ibid.).

Since then new degrees had been created at Oxford and Cambridge but no postgraduate course leading up to them. If these were arranged, American graduates 'would come chiefly for Natural Science and for History; some also for Economics, for Philosophy and Theology, not many for Law because the leading American Law Schools are admirable. So far as one can guess the total number would be large enough to make it worth the while of the Universities to provide the courses.'[1]

As for 'practical steps to be taken, the first would seem to be to invite the British Universities generally (as it is hard to make exceptions even in the case of the four or five conspicuously weakest) to consider whether they are disposed to provide such post-graduate courses for overseas students. An official letter from the Secretary of State would not be required for this purpose, since the idea is likely to appeal to them.'[1]

He also suggested that direct inquiries from the presidents of the top twelve universities in the States might produce useful material around which British universities could frame postgraduate courses. And in conclusion, Lord Bryce suggested that 'What the Americans would gain from our Universities is too obvious to need describing; but our men would also gain by being brought into contact with a different set of ideas and a different type of character. Needless to say that nothing could be better for the political and social relations of the two countries than that the number of Americans of the most educated class who are attached to England by those ties of affection which a man forms at the most susceptible period of his life, should be greatly enlarged, and a wider basis for a mutual good understanding of one another's aims and sentiments created.'[1]

Lord Bryce's memorandum only served to confirm the general view that a committee should be set up to deal with the whole question. Lord Newton, at that time assistant under-secretary at the Foreign Office, also expressed some relief at this solution which he hoped would 'take the question out of our house'.[2] When forwarding Bryce's memorandum to Curzon he therefore also informed him of the renewed proposal to set up a small committee under Bryce's chairmanship.[3]

Curzon responded with the complaint that Bryce was out of touch with modern Oxford,[4] which was now on the point of putting through a scheme that he felt would meet the needs of American postgraduate students. Still opposed to the formation of the proposed committee, Curzon advised the Foreign Office to contact Cambridge and bring the whole matter to her notice. He made no mention of any other British universities.[1]

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[1] Ibid.

[2] Minute dated 4 November 1916 (Ibid.).

[3] Lord Newton to Curzon, letter dated 11 November 1916 (Ibid.).

[4] Bryce was now almost 80 years of age, but it would appear that he was a great deal more appreciative of the modern universities than was Oxford's much younger chancellor.

While Newton was at this point still pursuing the idea of a committee, he responded positively to Curzon's suggestion in relation to Cambridge. In a letter to her chancellor, Lord Rayleigh, he explained the problem as seen by the Foreign Office and added that they understood 'that advanced students who pursue a course of research for two years or more are likely to look for a Doctor's degree such as has been open to them in Germany in the past.'[2] In passing Newton's letter on to his vice-chancellor, A.E. Shipley, Rayleigh suggested that Senate might tentatively appoint a representative to sit on the committee proposed by the Foreign Office.[3]

Perhaps the most extraordinary aspect of this whole set of Foreign Office papers is that they made no mention of the existence of the Universities Bureau of the British Empire, which might well have served — and in the end did in fact serve — as the instrument through which the government could achieve its aims. Nor did the Foreign Office seem to be aware that a number of universities besides Oxford were at this very time concerning themselves with these questions.

American inquiries stimulate British universities to consult one another on the provision of postgraduate courses and higher degrees

On 1 October 1916, the president of the newly formed American Association of University Professors, J.H. Wigmore, had addressed a letter to the principals and vice-chancellors of the universities of the United Kingdom,[4] informing them of the existence of his organization and its earnest desire to take up contact with universities in other parts of the world. The key point of Wigmore's letter concerned the recognition (for purposes of entry to advanced studies in British Universities) of diplomas and certificates awarded by colleges and universities of the United States. He appreciated the considerable difficulties British universities had in discriminating between some 700 such American institutions of diverse quality and therefore appended a list of those whose Bachelors degrees were in his country regarded as of first rank and therefore comparable with the best in other parts of the world. His Association wished to know the attitude of British universities to this list which had been drawn up by the Carnegie Foundation.[1]

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[1] Lord Curzon to Newton, letter dated 19 November 1916 (Ibid.).

[2] Lord Newton to Lord Rayleigh, Chancellor of the University of Cambridge, dated 30 November 1916, in papers relating to the Minutes of the Council of the Senate meeting of 4 December 1916 (University of Cambridge Archives).

[3] Lord Rayleigh to A.E. Shipley, letter dated 2 December 1916 (Ibid.).

[4] J.H. Wigmore to Vice-Chancellors and Principals of the Universities of the United Kingdom, letter dated 1 October 1916. A copy is to be found in the archives of the University of Edinburgh.

The problem of distinguishing between the standards of various American institutions calling themselves universities or colleges had indeed arisen with increasing frequency and a number of British universities welcomed this offer of guidance from a seemingly reputable organization of American academics. However, in considering the standard of admission to be required from American students wishing to study for higher degrees, the whole question of what kind of higher degrees, if any, were in fact available to these students, was raised once again.

Thus, for example, Manchester's Senate set up a committee on the 'Letter from the American Association of University Professors', which quite early on in its deliberations decided to recommend the acceptance of the American list. It continued to meet, however, in order to consider the introduction of a new research degree to meet the needs of overseas students. This may well have been due to the particular influence of two of its members, Rutherford and Tout who — six months later — as Senate's representatives before the Council of the University, played a vital role in persuading that body to overcome its considerable hesitations regarding the introduction of the PhD degree.

Some years before the arrival of Wigmore's letter,[2] the University of Leeds had already been considering what encouragement might be given to her own staff and graduates, as well as to graduates of other United Kingdom, colonial and foreign universities, to engage in advanced studies, and how these should be rewarded by academic qualifications. This had led, during 1915, to a Committee of Senate undertaking a detailed survey of the provision made at other United Kingdom universities and the conditions on which they granted their higher degrees.

Now the inquiry from the newly formed American Association of University Professors gave fresh impetus to Leeds' concern. Her vice-chancellor, Michael Sadler, wrote to Hadow of Newcastle, expressing his belief that inter-university consultation and common action on these matters were most important. The policy at Leeds had been to keep her doctorate at a very high standard indeed, but some of his colleagues now thought that it might be offered on easier terms of residence to foreign students. Sadler felt this to be 'an impossible position' and while he took it to be 'partly a question of Imperial policy', he confessed himself 'very much puzzled about the answer.'[1]

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[1] This was the list which a few years before had been sent to the German universities in a similar attempt to regularize the acceptance of American graduates for study there. See above, pp. 20-1.

[2] In accordance with a resolution by her Convocation of 4 February 1913 (T I Higher Degrees, University of Leeds Archives).

And Sadler clearly remained ambivalent on this question for some time to come. Only a few weeks before, he had received a letter from the then vice-chancellor of Sheffield, H.A.L. Fisher, proposing just such a new foreigners' doctorate. Indeed Fisher had suggested a doctorate requiring only one year's residence, which would make it analagous to the 'Doctorat de l'Université' that the French bestowed exclusively on foreigners. 'It would be very simple to carry out such a plan,' Fisher believed, as 'it would not involve an elaborate overhauling of our existing Statutes which are well adapted to the needs of our own students and it would enable the Universities to undertake combined action with the maximum rapidity and without any fear of compromising any of the delicately balanced parts of our present educational equilibrium.'[2]

Sadler was clearly impressed by this solution, which would save much time and circumvent the whole problem of protracted inter-university negotiations. 'Your plan for a Doctorate appeals to me strongly,' he wrote to Fisher. 'Believing that it is urgent that we should do something to meet this special need, I can see nothing against your suggestion and thank you for telling me about it so fully.'[3]

But no other university took up this idea and by February 1917, Sheffield, which by now was in the charge of acting vice-chancellor Ripper, had informed Sadler that they intended to introduce the PhD, 'to be open to graduates of foreign and colonial universities'[4] and Miers of Manchester had written about his university's desire to institute a new type of Doctors degree 'to meet' ... 'the needs of our own students' as well as those from overseas.[5]

Hadow of Newcastle was also against a research degree on easier terms for foreign students 'But,' he added, 'in the case of post-graduate distinctions I have always felt that the question of intellectual quality is far more important than the question of standing. Personally I should be ready to admit to a Doctorate any one who having passed the preliminary tests presents a piece of work of sufficient merit, whatever the length of time that had elapsed since his previous degree (of course there would have to be some period of residence and study). But I should see to it that the test applied to his work should be of a severity which was never relaxed.'[6]

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[1] M.E. Sadler to W.H. Hadow, (copy of) letter dated 4 November 1916 (T I Degrees for Overseas Students, Association of American University Professors, University of Leeds Archives).

[2] Herbert Fisher to M.E. Sadler, letter dated 23 October 1916 (Ibid.).

[3] M.E. Sadler to Herbert Fisher (copy of) letter dated 25 October 1916 (Ibid.).

[4] W. Ripper to M.E. Sadler, letter dated 6 February 1917 (Ibid.).

[5] Henry A. Miers to M.E. Sadler, letter dated 6 February 1917 (Ibid.).

[6] W.H. Hadow to M.E. Sadler, letter dated 6 November 1916 (Ibid.).

Oxford calls a Conference of English Universities

Hadow had written to other universities too, asking for joint discussions on these matters and found the vice-chancellor of Oxford, Thomas B. Strong, particularly receptive to his suggestion. An Oxford man, Hadow had been a fellow and tutor of Worcester College before taking up the principalship of Armstrong College. His proposal for a meeting corresponded to the points made by the Foreign Office which Curzon had just passed on to his vice-chancellor. And while Curzon himself had shown no interest in involving any but the two ancient universities in these questions, it would appear that the Hebdomadal Council was more prepared to consult with the others.

And so they sent an invitation to all the vice-chancellors and principals of the English universities, to meet in Oxford on Saturday 16 December 1916, to consider under what conditions American and other foreign students who had been in the habit of taking postgraduate courses in Germany might be encouraged to come to English universities for such courses and possibly for research degrees.[1]

In opening the conference, Oxford's vice-chancellor referred to the letter from the American Association of University Professors and the interest expressed by the Foreign Office in these matters. He emphasized 'the desirability of combined action, if possible, and the maintenance of British intellectual standards in post-graduate study and research."[2]

Hadow suggested 'that the provision of postgraduate research and degrees for American students' which was 'the main problem for settlement' might well be met by the introduction of a mastership, normally requiring two years' and exceptionally one year's residence, to be followed by a doctorate in either letters or science, with a thesis of high quality but not necessarily involving further residence or standing.

W.L. Mollison from Cambridge, on the other hand, stated emphatically that his university's General Board of Studies was 'unanimously agreed against granting a doctorate after two years' residence.' A mastership after such a short time was another matter and this was at present under positive consideration at Cambridge.

No resolutions were put to the meeting but according to the report to the Hebdomadal Council, the following six points emerged from the discussions:

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[1] See letter from Thomas B. Strong to the Vice-Chancellors and Principals of the English Universities dated 2 December 1916. A copy exists among the papers related to the University of Cambridge Council of the Senate meeting of 4 December 1916 (University of Cambridge Archives).

[2] According to the report presented to the Hebdomadal Council by Grant Robertson of All Souls, entitled 'American Students and Post-graduate Research Degrees', 29 December 1916 (HC/M/3/46, University of Oxford Archives).

'1 The establishment of two Doctorates (i.e. a Doctorate in Letters or Science and a PhD) obtainable under different conditions of both time, work, and status would tend to confusion, and to impair the value of both; and was therefore undesirable.

2 The establishment of a Doctorate for foreign students only, on special conditions, was not desirable. The existence of such a one at Paris had not, in the opinion of several speakers, justified itself.

3 There was a very considerable difference of opinion as to the desirability and character of an initial test for all students for research degrees, and as to the best method of carrying out such a test, particularly with reference to students from American Universities. The discussion turned on the recognition of approved degrees or courses of work or the recognition of approved Universities, as against a test simply of the candidate's general fitness for research.

4 There was also considerable difference of opinion as to whether a research degree which was not a Doctorate would attract foreign, and particularly American, students. There was general agreement that, after the war, in all probability there would be a large increase in the number of foreign and American research students and that it was eminently desirable to encourage and provide for this increase.

5 It was generally agreed that the Universities should, apart from research degrees, grant certificates of research work done by students who were unable to reside long enough to obtain a Research Degree.

6 The value of the Conference was emphasised as enabling the Universities to have in advance information as to change in their regulations, and as an important step to a common policy not merely in the organisation of post-graduate work but of other equally vital problems of University education.'[1]

Professor Gillespie, who represented Leeds at the conference, reported to his vice-chancellor that there had been quite a strong feeling against accepting the Carnegie list of American academic institutions, with several speakers mentioning 'cases of extreme illiteracy in American Students who have come before their notice.'[2] This led Leeds Senate to postpone its reply to Wigmore, pending further consultations with her sister universities of the north.[3]

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[1] Ibid.

[2] C.M. Gillespie, Pro-Vice-Chancellor of the University of Leeds, Report of the Conference at Oxford on Higher Degrees (T I Degrees for Overseas Students, Association of American University Professors, University of Leeds Archives).

[3] University of Leeds, Minutes of the Senate, 7 February 1917

H.A.L. Fisher and the Board of Education take over from the Foreign Office

The Foreign Office had now become aware that Oxford was proceeding with plans for making doctorates accessible to advanced students, and that Cambridge was considering the matter, but still knew nothing of the movements in this direction at other British universities. Nor was it informed about the Oxford conference, to which no reference appears to have been made in any discussions at government or university level. In the eyes of the Foreign Office then, the protracted negotiations on the whole matter seemed to be yielding little practical result and it was with relief that they took up Leonard Whibley's suggestion to pass the problem on to a more appropriate body.

In a letter dated 3 January 1917, the need for provision for American research students at United Kingdom universities was explained to the secretary of the Board of Education. He was informed that Oxford and Cambridge were already considering the matter but that 'Mr Balfour is of opinion that it is desirable that the question should be referred to the other Universities in England and the Universities of Scotland, Ireland and Wales for their information and consideration. ...'

The letter went on to suggest that 'one obstacle to the access of research students to the Universities of the United Kingdom ... might be' overcome 'by the appointment of officials at the different Universities to receive applications from intending students, or possibly by the institution of some central Bureau, which would be able to furnish information not only as to the facilities offered by the different Universities for courses of research and the degrees offered but also as to the educational qualifications required from the students who desire to undertake such courses.'[1]

The Foreign Office's continued ignorance of the Universities Bureau and its Year Book, shows how wise a step it was to bring in the Board of Education. Its new president, H.A.L. Fisher, had resigned from the vice-chancellorship of Sheffield only a few weeks beforehand, to take office in Lloyd George's new coalition government.[2] In close touch with the current position in the very universities which Balfour now wished to involve alongside Oxford and Cambridge, Fisher soon found an opportunity to further the views expressed by the Foreign Office which he shared.

In a speech at a dinner of the University of London Club at the end of that month, he prepared the way for future action. Assuring his audience that 'he was a great believer in the autonomy of the English Universities...' he 'hoped that nothing he might do as President of the Board of Education would have the slightest tendency to abridge what he thought was one of the most precious features of our educational system. At the same time, he thought the universities might practice the virtue of co-operation to a greater extent than they had hitherto done. One such occasion presented itself to-day. The University of Oxford were considering the question of devising courses of advanced study of which advantage might be taken by students from the Colonies and Allied countries, as well as the United States. ... There would be great practical advantage if the course were to be uniform, or roughly uniform, throughout the British Universities.'[1]

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[1] Victor Wellesley of the Foreign Office to the Secretary of the Board of Education, letter dated 3 January 1917 (FO 395/11 Public Record Office).

[2] On 14 December 1916

The Board of Education had already been approached over a considerable period by education ministers of various countries of Europe wishing to know what facilities were available to their students in Britain. They tended to assume that British universities were run by the state as they were in their own countries, or at least that the government would know what was going on inside them. Fisher's predecessor, the Earl of Crewe, had experienced increasing difficulties in giving satisfactory replies to his counterparts in France, Italy, Russia, etc. and now Fisher himself was becoming acutely embarrassed by their persistent inquiries, which he could only pass on to individual universities — usually Oxford and Cambridge. Clearly it would be a great help to him if there were a body of university representatives to whom he could refer the queries and obtain some kind of unified answer.

Unlike his colleagues at the Foreign Office, Fisher was very much aware of the existence of the Universities Bureau of the British Empire and recognized the useful role it might play in calling together the British universities for the purpose of discussion and co-operative action vis-à-vis their counterparts in other countries. He contacted its secretary, Dr Alex Hill, and on 20 February 1917, Bureau Committee members representing the various British universities attended a meeting at the Board of Education.

They included Sir Donald MacAlister for the Scottish universities, who was also chairman of the Bureau; R.F. Scott, master of St. Johns, for Cambridge; Michael Sadler, vice-chancellor of Leeds, representing the five Northern universities; and Sir Henry Miers, treasurer of the Bureau, who had originally represented London University on the Bureau Committee, but from 1915 had been vice-chancellor of Manchester. London was without direct representation until Miers' resignation in 1918, when her vice-chancellor, Sir Cooper Perry, took his place. This exclusion of London University from the Bureau Committee during these vital years was to be of considerable significance, since it resulted in her virtual isolation from some of the important discussions currently taking place. And this may well have contributed to her negative attitude on the question of the PhD.

The president of the Board of Education attended the meeting, accompanied by his life-long friend Gilbert Murray, whom he had appointed to the post of director of Special Inquiries and Reports and head of the

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[1] Mr Fisher on Universities (1917)

University Branch of the Board.[1]

There was no official report of this meeting at the Board of Education, but the following day the Cambridge representative, R.F. Scott, wrote a sketchy note[2] to his vice-chancellor from which it would appear that some delegates, and especially Sir Donald MacAlister for the Scottish universities, had made it clear that any steps taken must in no way imply interference by the English Board of Education. 'In the end,' Scott reported, 'although no definite resolutions were passed, something like the following was agreed upon: that Mr Fisher through the Bureau should invite English, Scotch and Irish Universities to appoint members of a deputation to discuss the matter further. The impression left on my mind was that those members of the Bureau who were present all expressed themselves in favour of an interchange in general terms without committing their governing bodies to any scheme.'

Within days of returning to Leeds from the meeting, Sadler was able to report to Fisher that the Council of his university had accepted his proposal that there should be co-operation between the Office of Special Inquiries and Reports[3] and the executive committee of the Bureau. In a subsequent letter to Murray, Sadler reported that Senate, having endorsed the proposal, 'felt that, in the present emergency, some working arrangement should be adopted without delay. Some of those present expressed the view that, if a standing committee of the Universities is set up, the Government might find this a more representative body than the Executive Committee of the Universities Bureau.'[4] No doubt Murray welcomed this suggestion, which coincided with the views of Fisher and himself.

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[1] Replying to Murray's congratulatory message on his becoming president of the Board of Education, Fisher had told him that he felt 'there was a real chance, if I could rely upon help from Haldane and you and Sadler and Hadow and other friends, to get improvements upon a large scale started which would endure long after the war and bring permanent benefit to the country' (Herbert Fisher to Gilbert Murray, [copy of] letter dated 12 December 1916, Herbert Fisher Papers Dept. of Western Manuscripts, Bodleian Library, Oxford). In the event, he is most widely remembered for his Education Act of 1918, but his influence on university education, though less widely known, was also to be considerable.

[2] R.F. Scott to the vice-chancellor of the University of Cambridge, letter dated 21 February 1917, which came before the Council of the Senate at its meeting of 26 February 1917 (University of Cambridge Archives).

[3] Sadler had been the first director of this department when it was formed in 1894.

[4] M.E. Sadler to Gilbert Murray, letter dated 2 March 1917 (T I Higher Degrees, Students from Overseas, University of Leeds Archives).

Meanwhile the Bureau's secretary also carried the message of the meeting at the Board of Education into the universities, and suggested that a conference to discuss these matters at greater length might help provide Mr Fisher with the necessary information on which to base at least a provisional reply to the inquiries he had received from foreign governments.[1] Two weeks later Hill followed this up by sending out copies of a communication he had received from Gilbert Murray on certain questions of urgency which called 'for some co-operation or common action by the Home Universities.'[2]

Among these Murray indicated the 'interchange of students, and also of teachers, between British and Foreign Universities and of arrangements for making the British Universities more accessible and attractive to students from the Allied Countries, or indeed from America and Scandinavia, where the German influence has hitherto been so strong.' And if these questions were faced, it would 'hardly be possible to avoid considering similar provisions for interchange between the Home Universities themselves and among the Universities of the Empire.'[2]

One aspect of this had already come before some of the universities, wrote Murray, and that was 'the provision of advanced courses of study, with some higher Degree at the end, for graduates of foreign and colonial Universities. The prospects of success in this direction will be brighter,' he added, 'if some general agreement on the matter can be reached.'[2]

Two further points for inter-university consultation were the economics of specialization as between universities — to avoid duplication of expensive research and teaching — and the universities' recognition of studies undertaken by British prisoners of war while in captivity. In conclusion, Murray invited further suggestions for topics that might call for some co-operation among universities.

On 13 April, Hill sent out invitations to a United Kingdom conference on 'Interchange of Students and Teachers between the Universities of Great Britain and those of Allied and Neutral Countries' to be held in London on Friday 18 May 1917. It was to be purely consultative and any vote taken would not be regarded as binding. The universities were therefore welcome to send more than one representative each.[1]

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[1] Alex Hill, Secretary of the Universities Bureau of the British Empire, to the Vice-Chancellors and Principals of United Kingdom Universities, dated 28 February 1917. A copy exists, amongst other places, in Oxford University Archives, Hebdomadal Council Papers dated 6 March 1917, relating to the Hebdomadal Council Meeting 12 March 1917 and in Cambridge University Archives, papers relating to a meeting of the Council of the Senate, 5 March 1917.

[2] Gilbert Murray to Alex Hill, letter dated 10 March 1917 (a copy exists in T I Higher Degrees, Students from Overseas, University of Leeds Archives).

Of the six items on the proposed agenda for the conference, five dealt with various aspects of migration of students and teachers, such as the expected standing of students and financial assistance for them; sabbatical leave for teachers; the faculties in which migration was to be specially encouraged and the dissemination of information on British universities by means of a special handbook. Only one item related to 'the nature and titles of degrees accessible to immigrants and the conditions of obtaining them.'[2]

Yet of the nine resolutions passed at the conference itself, six were directly concerned with facilities for advanced studies at British universities and four of these with the possible introduction of a new doctorate! A partial explanation for this apparent anomaly is to be found in an event that took place just prior to the conference and which appears to have strongly influenced its discussions and final outcome.

The Northern universities jointly decide in favour of a lower doctorate

The five 'Northern universities' (Manchester, Leeds, Liverpool, Sheffield and Birmingham) which formed the Joint Matriculation Board, used to meet from time to time, since they had to reach agreement on the basic principles of any innovations in their academic regulations. Manchester's Senate had therefore instructed its vice-chancellor to invite her four sister universities to discuss the points that had been raised in Gilbert Murray's memorandum and Sheffield had already asked for such a meeting to deal with the question of research degrees. It seemed sensible to hold it before the London conference to enable the Northern universities to participate with a more unified voice. And so the date chosen was 12 May 1917.

Manchester University archives hold detailed draft minutes of this meeting[3] which provide us with a much fuller record than we have been able to discover for the larger conference that was held the following week in London. The Northern meeting began with a resumé of the views of each of the five universities on the introduction of a new research degree: while Manchester had agreed upon a two-year doctorate, it had not yet determined its title; Liverpool and Birmingham had not passed definitive resolutions on the subject; Leeds did not like the idea of a 'lower doctorate'. Sadler reported that they had 'passed no resolutions on the subject. They desire[d] to be informed whether there is a need, on political and international grounds, for the institution of a Doctorate after two years. If so, they would reluctantly acquiesce — would desire to act with other universities.'

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[1] Alex Hill to Vice-Chancellors and Principals of Universities and University Colleges of the United Kingdom, letter dated 13 April 1917 (a copy to be found ibid.).

[2] This agenda was sent out by the Secretary of the Bureau on 9 May 1917 (Ibid.).

[3] Draft Minutes of the Proceedings at the Conference of Representatives of the Universities of Manchester, Liverpool, Leeds, Sheffield and Birmingham, held at Manchester 12 May 1917 (Conference I, Vice-Chancellor's Archive, University of Manchester Archives).

In fact there exists a memorandum in Leeds archives, signed MES and dated 9 May 1917, which Sadler had evidently prepared as a basis for discussion at this Northern universities meeting. It was headed 'Doctorate for Students from Overseas'. In this Sadler suggested that if American students were to be diverted from German universities now and after the war, and if urgent provision for advanced studies were to be made for Colonial and other foreign students in Britain, it could not be left to the universities to act on their own. Neither did he believe they would, or even could, act sufficiently quickly and in unison.

Referring to 'the absence of many members of their Senates on active service ...' he believed that universities would hesitate to act on such an important matter. Moreover, 'the form of organisation of higher studies which is peculiar to this country disables it at this juncture from making promptly a collective offer of facilities for advanced students from abroad and even from an immediate and joint publication of existing opportunities for study and research.'

He therefore concluded that 'arising as a war emergency, the need points to action by the Government. The Government alone is in a position to act without delay and, on behalf of the country, to show the national desire to meet the requirements of students from overseas in the way which would fulfil their expectation and requirements.' Sadler expressed the hope that the government would 'establish a State Diploma, entitling the holder to the style and title of doctor, to be awarded for advanced study and independent investigation pursued for a period of not less than two years, by students of approved qualifications, at certain approved institutions in Great Britain. ... Such an arrangement would leave undisturbed the regulations laid down by each University for its own higher degrees.'[1]

Clearly Sadler was reiterating the idea originally put to him by Fisher,[2] though the latter had by now come to a more optimistic view on the possibilities of inter-university agreement, and in the course of the current meeting Sadler too became persuaded of the need to institute a PhD for all students rather than a state doctorate for foreigners. He did not put his memorandum to the meeting but acquiesced in the general concensus of the sister universities.

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[1] Doctorate for Students from Overseas. A typewritten memorandum by Michael Sadler, dated 9 May 1917 (T I Higher Degrees, Students from Overseas, University of Leeds Archives).

[2] See above, pp. 122-3.

Sheffield, having already decided in favour of a two-year doctorate, made the additional proposal that the degree should not be open to her own graduates, because a change of university at this point in their academic career would be beneficial. After a lengthy discussion of this scheme, which ipso facto could only function if most other universities agreed to it, it was felt that to insist on a change of university after graduation would exclude the poorer student who could not afford to live away from home. Sheffield's further suggestion, that the Board of Education might consider subsidizing such students, did not convince the other delegates, but it was agreed that if their particular studies merited it, students should be encouraged to spend part of their time at a different university.

There then followed a long and somewhat heated discussion on the title to be given to the proposed new research degree. The institution of a lower doctorate would make the position of the mastership ambiguous. Yet the mastership was a meaningful English degree which should be preserved. Others, who felt that as at present constituted it was far from meaningful, suggested its retention nevertheless, but that its level should be raised and that it should take the place of the proposed lower doctorate. The PhD with its German associations was an unpopular concept. In any case, a lower doctorate would jeopardize the standard and meaning of the higher doctorate.

On the other hand, it was repeatedly pointed out that the whole purpose of attracting overseas students by these new research degrees would be defeated if they did not entitle their holder to the coveted title of doctor. It was therefore finally agreed 'that in order to attain unity, this Conference is prepared to recommend that the title of the degree should be "Doctor of the University" or "Doctor of Philosophy",' but 'that the balance of advantage would lie with the adoption of the title of "Doctor of Philosophy".'[1]

The United Kingdom Universities Conference of 18 May 1917 recommends the PhD

The official report of the United Kingdom Universities Conference of 18 May 1917 contains little more than the names of those present and the text of the resolutions. There also exist in the archives of his university some informal jottings by Sir Henry Miers of Manchester,[2] which strongly underline the high degree to which this meeting was influenced by the decisions of the Northern Universities Conference of the week before. And this in turn explains why the resolutions passed in London centred so much more around the provision of a research degree in British universities than the more general question of teacher and student exchange which, according to its title and preliminary agenda, had been the intended purpose of the conference.

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[1] Draft Minutes of the Proceedings at the Conference of Representatives of the Universities of Manchester, Liverpool, Leeds, Sheffield and Birmingham, held at Manchester 12 May 1917 (Conference I, Vice-Chancellor's Archive, University of Manchester Archives).

[2] M.A. Miers. A three-page handwritten memo entitled Conference of Universities May 18, 1917, at Imperial Institute (Ibid.)

At any gathering — especially one which is scheduled to begin at 3 pm and has to be concluded that same afternoon to allow participants to return to their often distant homes that night[1] — a ready-made set of resolutions which embody some basic points already accepted by five important institutions represented there is likely to be welcomed, at least as a basis for discussion.

In the event, Mier's notes began with the entry: 'H.A.M. [Miers] read M/C resolutions at suggestion of Lodge.' And referring to the Manchester resolutions at various other points in his notes, Miers finally concludes with the short remark: 'All M/C Resns. passed'. This was correct, except in one important detail. The actual title of the new doctorate, about which the Manchester meeting had remained somewhat ambivalent, was now, in London, firmly recommended to be the PhD. From the offical report of the London conference, however, we also know that this was the only resolution not to be passed unanimously and one might hazard a guess that the two in opposition (who were not named) were the representatives of Cambridge and London.

The nine resolutions finally agreed at the London Conference were as follows:

'1 It is desirable that the facilities now existing in the universities of the United Kingdom for "graduate" students from foreign universities and British Universities overseas should be increased; and to this end the Home Universities should be enabled to develop more fully their arrangements for promoting advanced study and research.

2 For this purpose it is essential that a very considerable addition to the resources of the Home Universities should be made, with a view to
   - a The provision of a larger staff of the higher teachers in special branches;
   - b The further equipment of laboratories, libraries, etc;
   - c The provision of research studentships and fellowships, including some reserved for advanced students from the British Universities overseas;
   - d The publication of special researches and studies;

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[1] This, and the many conferences and committee meetings of a similar nature which followed it, were of extraordinarily short duration, frequently taking under two hours.

e The reduction or remission of fees to "graduate" students.

3 For the better promotion of research in this country, and for the encouragement of advanced work by "graduate" students from abroad, a degree or title of Doctor should be instituted, attainable after a period of not less than two years of whole-time work devoted to advanced study or research at one or more universities or institutions connected therewith: or an equivalent period of such whole-time work spread over a longer term of years.

4 The existing doctorates of the Home universities should, if possible, be maintained, and their present standard should not be lowered.

5 The title of the doctorate conferred on "graduate" students who have completed the contemplated course of advanced study or research should be the same, whatever the faculty or subject of the course; and the same title should, if possible, be adopted by all the Home universities for the doctorate in question.

6 The Conference is prepared to recommend that the title of the doctorate in question should be PhD (Philosophiae Doctor).

7 It is desirable (though under present conditions difficult of attainment) that arrangements should be made or facilitated for the interchange of professors and teachers between the Home universities and the universities abroad, and for the granting of periodic leave of absence to professors and teachers for purposes of study or instruction outside their own universities.

8 It is desirable that for students of the Home universities increased opportunities for, and recognition of, study and research in universities abroad should be provided; and the Chairman is requested to appoint a Committee for the purpose of collecting information and preparing a report on this subject to be circulated among the members of the Conference.

9 It is desirable that the Universities Bureau should undertake the preparation of a Handbook on the subject of "graduate" study and research in the Home universities, giving information as to the Departments of work to which they severally give special prominence; as to fees and cost of living; as to requirements regarding previous graduation or its equivalent; and generally as to the conditions and regulations for advanced study and research in each university.'[1]

With this momentous set of resolutions passed by a highly representative gathering of United Kingdom universities, it was certain that the trend already evident in most of them would now be set more firmly on course for the PhD.

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[1] From a small 4 page printed folder entitled Conference of Interchange of Students and Teachers, which records those present and the resolutions passed. A copy exists in London University Archives, among papers relating to a meeting of the Senate, 23 January 1918.

THE PHD ARRIVES

Oxford is the first to introduce the PhD — in 1917

The resolutions passed at the conference of May 1917 represented a major milestone in the history of British graduate education. But they were not binding on individual universities, any more than similar conference decisions are binding on individual universities today. The real key to action will be found only in the senate and court rooms of the universities themselves.

As has been seen, the Northern universities were already on the verge of introducing the PhD or an equivalent research degree, and now even Sadler of 'Leeds had been persuaded of its political necessity. He had not been able to attend the London conference himself, but within a week of receiving his representative's report on it, he drafted a document entitled 'Proposed new Degrees'[1] which underwrote its decisions and recommended speedy action to implement them.

By the end of 1917 each of the five universities on the Joint Matriculation Board had either ratified, or was about to ratify, the introduction of the PhD on very similar conditions. But there was one university that had in fact overtaken them in this move. And if once again the course of events at Oxford is examined in some detail, it is on this occasion justified by the indisputable, if not generally known fact, that Oxford was indeed the first British university to award the PhD or — as in its traditionally individualistic fashion it designates it — the DPhil.

In December 1915, the Hebdomadal Council had appointed a committee 'to consider whether (in view of the new conditions likely to arise after the war) any further facilities can be provided in Oxford for advanced students from America, from our Colonies, and elsewhere.'[2]

'The Committee on American Students' as it came to be known, included amongst its members only one of those who had sat on the original committee of that name twelve years before.[3] He was H.T. Gerrans of

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[1] Document marked 'Private': Proposed New Degrees, Memorandum by the Vice-Chancellor, 25 May 1917 (T I Degrees for Overseas Students/ American Professors, University of Leeds Archives).

[2] See Minutes of the Hebdomadal Council, 13 December 1915 (University of Oxford Archives).

[3] See above, p. 75.

Worcester College, Secretary of the Local Examinations Delegacy, who had for many years been playing an active part in the promotion of graduate studies at Oxford.

The new committee, utilizing its very broad terms of reference, proposed some sweeping measures that they believed might turn Oxford into 'something of a centre for advanced studies for the Anglo-Saxon world' by which it may 'promote sound learning, even more than it has done in the past, and may also bring into closer intimacy and co-operation, with results that may go even beyond the promotion of sound learning, the whole body of English-speaking peoples.'[1]

In the first place they recommended a 'recasting of the Doctorate in Letters and Science ... both for the sake of encouraging research work among the best men who have taken the Arts course at Oxford, and for the sake of attracting to Oxford the best type of advanced students from other Universities.' The DLitt and DSc were now to be made available to first and second class Honours graduates of two years' standing. Other Oxford BAs would require three years and also have to satisfy the university of 'their fitness to pursue a course of advanced study.' Graduates of other universities were now also to be eligible for the doctorates, after three years of advanced study at Oxford, or two if they could show proof of at least one year's postgraduate study at their previous university.

The degrees would be awarded on the basis of a dissertation, a viva voce and possibly a written examination. Their standard would remain above that of the BSc and BLitt. The committee felt, however, that because of the considerable reduction in time required for the doctorates, there would now be few, if any, candidates for the research bachelorships, and recommended their abolition. They also proposed that Oxford Bachelors should continue to be able to obtain the doctorate on published work alone.

The old Education Committee that had vetted aspiring candidates for the BSc and BLitt was to be replaced by a 'Committee for Advanced Studies', which would be responsible for sifting applicants who wished to acquire the newly created status of 'advanced student'.[2]

The Hebdomadal Council adopted most of the proposals but decided to retain the degrees of BSc and BLitt. A suggestion from the General Board of Faculties, that if a doctoral candidate's work was not of sufficiently high standard he might be considered for the lower degree, was not accepted at that time.

By November 1916, the Hebdomadal Council was in a position to approve draft statutes for the new measures.[1] Furthermore, in view of their great importance, and in an effort to obviate misunderstandings, the unprecedented step was taken of accompanying the proposed statutes by a special note to explain their purpose and meaning when publishing them in the University Gazette.[2] The first paragraph of this 'Note' ran thus:

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[1] Report of Committee on American Students, as amended, 23 May 1916 (HC/M/3/45 University of Oxford Archives).

[2] Ibid.

> 'The purpose of these Statutes is the provision of further facilities for advanced students, including those who may wish to come to Oxford from other Universities in the United Kingdom, the British Dominions, the United States of America, or elsewhere. They thus attempt to meet a need which is likely to be of considerable importance at the end of the war. Graduates from American Universities, in particular, have been in the habit of going abroad for the purpose of taking a post-graduate course. Comparatively few of them have hitherto come to Oxford for this purpose, because there has been no postgraduate degree which was sufficiently attractive. It is probable that a number of those who in previous years would have gone to German Universities in order to obtain a Doctorate will not do so in the future, and it seems desirable to provide a course and a degree which will be likely to attract them to Oxford. It seems further desirable, on general grounds, to make additional provision for the promotion of advanced studies at Oxford. It is hoped that the scheme contained in these Statutes will encourage such studies, and will help to bring to the University a number of advanced students from the Anglo-Saxon world."[3]

It went on to describe in simple terms the meaning of the revised statutes and concluded with the following important points:

> 'It is recognised that differences of opinion may exist about the style of the degree to be awarded to Advanced Students; and the preamble of the Statute has been so drafted as to admit of amendment on this point. But it is probable that the subjects in which Advanced Students are likely to undertake research will be in all cases covered by the terms Letters or Science; and Statute I is framed on the assumption that in view of the requirements imposed, the Doctorate is the degree which students who satisfy these requirements are entitled to expect."

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[1] See Report of Committee on Advanced Students, Revised, 1 November 1916 (HC/M/3/46 University of Oxford Archives).

[2] This new method of 'advocacy in the form of explanation' was to cause consternation in some quarters (See Editorial, *The Oxford Magazine* 26 January 1917).

[3] Report of Committee on Advanced Students, Statutes, DLitt and DSc: Draft Note, 5 December 1916 (HC/M/3/46, University of Oxford Archives).

And so, while making it quite clear that the new form of degree would be a doctorate, it left open the exact 'style of the degree'. This caution was no doubt prompted by the considerable body of opinion on the Council which, while it favoured the creation of a new type of doctorate, did not wish to reduce the standard of the existing DSc and DLitt degrees.

Following the publication of the proposed statutes, E.B. Poulton, the prime originator of the scheme for the BSc and BLitt, declared the new measures to be a logical development of the ideas that had moved his colleagues and himself more than twenty years before. In a letter to the *Oxford Magazine*, he expressed the belief that a doctors degree was essential but that 'there would be a real loss in modifying the existing doctorates', which had a very definite and valuable function to perform in recognizing the contributions to knowledge made by the maturer mind. The simplest and least confusing way out would be the adoption of the continental PhD to run alongside them. It was a mistake to regard this degree as characteristically German, since it also existed elsewhere and in any case 'it would not be necessary, indeed it would be contrary to our usage, to indicate this degree by the PhD of the Continent. The Oxford form would naturally be DPhil.'[1]

G.B. Grundy was similarly opposed to the lowering of the standards of the present doctorates. Or, he asked, did those who proposed their being awarded after only two years' work 'expect to attract to this University a multitude of transcendent geniuses who can do in sixteen months or two years that which it has taken people like Dr Grenfell, Dr Hunt, Dr Farnell, Dr Macan and many others equally distinguished on the side of science, four or five times as long to produce?' Rather, if a Doctors degree were to be given on a dissertation of the standard implied in the current proposals, he suggested that it should be the 'PhD, a degree which is associated in America and elsewhere with that method of attainment.'[2]

W.H. Perkin, Waynfleete Professor of Chemistry, was the only participant in this correspondence who, in supporting the new scheme, strongly emphasized its role in holding Oxford's own students at the university after graduation. Under existing circumstances teachers at Oxford were experiencing the greatest difficulties in persuading graduates to stay on and he believed that only through the offer of a doctorate after two to three years of postgraduate study could you 'hope to retain the most promising students for research work or to attract graduates from other Universities.' He could not, however, agree with Dr Grundy's suggestion of running the PhD alongside the higher doctorates. It would cause much confusion and he would prefer to see the conditions for the DSc and DLitt altered. If, on the other hand, there was a large body of opinion against this, he believed there would be few 'who would not support the institution of the DPhil degree. ... The essential point is that a Doctorate shall be established which will encourage advanced study in Letters and Science.'[1]

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[1] Poulton (1917).
[2] Grundy (1916).

Rather than risk the whole scheme being defeated, Perkin thus committed himself to accepting — and was hopeful that most other members of Congregation would accept — the compromise of a DPhil.

The first of two meetings of Congregation on the new statutes took place on 30 January 1917 and was reported to have enjoyed a larger attendance than had been seen for a long time.[2] Whilst it did not go beyond a discussion of the preamble, this in itself left little doubt that, with few exceptions, members of the university favoured the general concept embodied in the proposed statutes. After Mr E.M. Walker of Queens College had introduced the proposal at some length, Sidney Ball of St Johns expressed his warm support for it, giving notice, however, that he and his friends[3] would be introducing an amendment at the next meeting to substitute the title of DPhil for the proposed modified DSc and DLitt. The open nature of the preamble fortunately made this possible and he trusted that with his proposed alteration this welcome statute would go through at the next meeting.

There was further support from Dr Macan, Professor Perkin and Dr Schiller, with only Dr Holland speaking in complete opposition, and the preamble was passed by sixty-nine votes to seven. The *Oxford Magazine* warned that 'the real fight will come on the question of the title of the new degree',[4] a prophesy which proved to be incorrect.

Congregation met again three weeks later, on 20 February 1917, and this time the major discussion centred around the amendments put by Sidney Ball and seconded by Professor A.C. Clark of Corpus Christi. In effect, these simply amounted to substituting the words 'Doctor of Philosophy' wherever the proposed statutes spoke of 'Doctor of Letters and Doctor of Science'. So much were they in agreement with the general principles of the statutes that they found no need to cloud the issue by raising any other points at all. They were anxious, they said, to maintain the standard of the older doctorates, not only in recognition of the independent and mature work of older men but also to honour great scholars of other universities. The function of the new degree would be to reward the earliest advanced work of young graduates. At the conclusion of what might be termed a friendly debate, the DPhil received eighty-nine votes, with only nineteen against.

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[1] Perkin, W.H. (Jr.) (1917).

[2] Notes and News (1917).

[3] The 'Club', with Sidney Ball still as its main spokesman after three decades (see above, pp. 52-3) — clearly continued to campaign for research degrees at Oxford.

[4] Notes and News (1917).

The *New York Times* proclaimed the good news under the headlines: 'Oxford Innovation to draw Americans'; 'University to Confer Research Degree of PhD for First Time in England'; 'Chance for Rhodes Men'; 'Action Taken to Divert Stream of Students This Country Has Sent to Germany'.[1]

One American college president's enthusiastic reaction was expressed in a letter written that same day to Gilbert Murray in England: 'I imagine that those of you who are in authority at Oxford can scarcely realise what this would mean for American students. It seems to me that it is a proposal which means more for the future of relationships of the universities of America and England than any other one thing which could be done.'[2]

Oxford's new statutes were enacted on 12 June 1917. The new Committee for Advanced Studies held its first meeting on 7 July 1917 and resolved to circulate a memorandum on the DPhil degree to all United Kingdom, colonial and Indian Universities whose students had up to then been eligible for senior student status and to all American universities on the Carnegie list whose graduates might now qualify for the new 'advanced student' status.

Finally, at a Hebdomadal Council meeting on 10 December 1917, a special decree was recommended to enable Ladshman Sarup of Balliol to supplicate for the degree of DPhil in the Trinity Term of 1919. This student had already been admitted for the BLitt on a similar subject in 1916. He would now be using this work towards his DPhil, thus totalling three years of study in all. And so it came about that Oxford awarded the first PhD in Britain.

Cambridge lags behind

If Oxford was in the van of the movement towards the PhD, Cambridge was on this occasion lagging some way behind.[3] True, she had been the first to introduce the DSc and DLitt back in 1883, and, like Oxford in 1895, she had established a method for reaching the bachelorship by research. Moreover, by the time Oxford was setting up her Committee on American Students at the end of 1915, Cambridge was already deeply involved in the review of her own research degrees.

Ever since February 1913, when she had 'tidied up' her regulations by abolishing the abbreviated tripos for advanced students,[1] the Cambridge 'researchers' had been seeking ways of encouraging more graduates to become 'research students' as they were now called. As it was, the only 'reward' they could offer them was a Certificate of Research after one or two years' study which could be converted into a BA if sufficient terms were kept and this was clearly not enough to attract large numbers of foreign students to Cambridge or to persuade many Cambridge students to continue their studies there after graduation. In fact, an average of only eight or nine Certificates of Research were awarded annually during their twenty-five years of existence.

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[1] Oxford Innovation to draw Americans (1917).

[2] President M.L. Burton of Smith College, Mass. to Gilbert Murray, letter dated 1 May 1917 (34 fols. 54-5; MS. Gilbert Murray, Department of Western Manuscripts, Bodleian Library, Oxford).

[3] For a detailed account of the introduction of the PhD in Cambridge, see also the second of three articles entitled 'The University and Research' (Sartain 1955).

Yet in 1911, when G.M. Trevelyan had somewhat apologetically invited H.A.L. Fisher to apply for a readership at Cambridge, he explained that his 'only statutary functions' would be '1) Research, by writing his own books and bringing distinction to the University by his publications and 2) looking after and making friends with the *best* third year men and young BAs — about 15 of them a year, advising them about dissertations etc.'[2]

True, some of these dissertations will have been directed towards gaining fellowships, rather than Certificates of Research, but Cambridge had indeed travelled a long way. Not only was she offering research-orientated work specifications for a teaching appointment, but she was showing marked concern that her best third-year men should be influenced by a university reader rather than a college tutor!

In 1913, the General Board of Studies set up a special committee on research degrees, whose report did not, however, come before the Senate until November 1916. It recommended the institution of the BSc and BLitt, to be awarded on the basis of a dissertation after a minimum of one year's study by Cambridge graduates or two years by graduates of other universities. Seven out of twenty-one members of the Board who had signed the report had however disassociated themselves from a further proposal, that these new Bachelors be admitted to the Mastership of Arts on the same conditions as Bachelors of Arts. Research degrees were now becoming acceptable, but such free access to membership of the university was a very different matter! A somewhat illogical argument, as the BA by research already led to the BA.

The meeting at which the Senate discussed the report began with the vice-chancellor reading a letter from the unavoidably absent J.J. Thomson who asked 'whether it might be possible to give to students who after six terms' residence have completed a satisfactory piece of research the titular degree of Doctor.' He felt that without this Cambridge was unlikely to attract those students who had previously gone to Germany for their postgraduate studies.[1]

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[1] For details of this see Cambridge, University of (1912a) and Cambridge, University of (1912b).

[2] G.M. Trevelyan to H.A.L. Fisher, letter dated 5 July 1911 (Herbert Fisher Papers, Dept. of Western Manuscripts, Bodleian Library, Oxford).

His point was taken up warmly by P. Giles, master of Emmanuel, who suggested that to award a doctorate 'might seem a great break with the past, but it was not really so great a break as it seemed, because the other Universities ... which had descended from the Middle Ages and had kept up the method of giving degrees by diploma had kept up also in their diplomas granted to Masters of Arts the double title *Magister Artium et Doctor Philosophiae*. Those were only two facets of the same thing, and, that being so, it would be possible to make a distinction and give the degree of Doctor of Philosophy to men who had distinguished themselves by a course of research.' He also 'understood that in the sister University a scheme of that sort was likely to come forward in the present term'.[2]

Dr Ridgeway, who had played an active part on the General Board's Committee for Research Degrees, was opposed to Cambridge lowering the standard of the present doctorate for the sake of increasing the number of research students from elsewhere. 'He remembered that when the Rhodes bequest to Oxford was first announced, he felt anxious. But he soon overcame that feeling, and he felt that Cambridge had lost nothing by not having the Rhodes scholars. They had the best Colonials coming to them and they had good Americans. ... Let them do nothing rash in order to secure more students.'[2] He himself would have liked to see an MSc and an MLitt as an intermediary stage between the BSc and BLitt and the doctorates. Such masterships, if they were of a sufficiently high level would be of great use to Cambridge men as well as to colonial students.

Most other speakers in the senate discussion also opposed a new doctorate, with Dr Hobson, Sadlerian Professor of Pure Mathematics, objecting most strongly to the term 'Doctor of Philosophy'. 'This was a piece of German goods made in Germany. It was not necessarily bad on that account, but it was an ordinary degree in German Universities, and it had been adopted by America. We in this country were not accustomed to using the word Philosophy in that sense. The nearest equivalent to it was Arts. If they were to do anything of the kind, he thought the degree should be Doctor of Arts.' The proposal for a PhD seemed to him to be 'a piece of window dressing quite unworthy of the dignity of the University.'[3]

In the event, the report was referred back to the Board of General Studies who subsequently reported that they were 'unable to recommend the establishment of a titular Doctorate to be given at the end of two years' research' as they considered the present higher standard required for the degree of Doctor of Letters and Doctor of Science to be 'a great incentive to research'.[3] They did however propose that the lower research degrees described in their earlier report should bear the title of MSc and MLitt, rather than BSc and BLitt.

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[1] Cambridge, University of (1916a).

[2] Ibid.

[3] Cambridge, University of (1916b).

At the Senate discussion on the amended report it was pointed out by the master of Clare, W. Mollison, 'that the Senate ought to realise quite clearly that, if these proposals were carried, and the proposals that had been made at the University of Oxford were carried either in their present form or in some amended form involving the granting of the Doctorate on a short period of research, Cambridge might stand alone. ...' He personally felt that they should not be afraid to do so, but that 'it was very important that the Senate should understand the situation.'[1]

And Cambridge bravely stuck to her guns — its Senate rejected a lower doctorate and agreed to institute new research degrees of MSc and MLitt.[2]

Meanwhile the *Times Educational Supplement* reported on the proposals then before Oxford Congregation in highly enthusiastic, even lyrical terms: Oxford was 'renewing her golden youth at the fountain of national necessity'. She was 'leading the way' and making 'her fitting and traditional contribution to national life in an age of difficulty and transition.'[3] Not unnaturally, this formulation called forth a somewhat strongly worded response from Cambridge.

Both Dr E.W. Hobson and Professor William Ridgeway indignantly declared that Cambridge was equally on her toes, but in a more dignified fashion. She was upholding the high standard of her doctorates which were awarded only for mature published work, whereas Oxford was proposing to give them after only a short period of study. Cambridge's present proposals for research masterships were a more logical step, acknowledging candidates as graduates, without stooping to lower the level of existing doctorates.[4]

To this there was a sharp rejoinder from Oxford's Percy Gardner, calling Ridgeway's letter a 'tissue of blunders' resulting form his eagerness 'to score off the sister University'. But in more conciliatory tones he suggested that the two universities should agree to compromise: if Cambridge dropped the idea of masterships and Oxford that of modifying its DSc and DLitt, the solution might well lie in them both adopting 'a Doctorate of Philosophy or Arts given only for research and adapted more particularly to the foreign student.'[5]

To this latter suggestion Ridgeway, who was Cambridge's Disney

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[1] Cambridge, University of (1917).

[2] At a Congregation of the Senate, 10 February 1917. (In fact these research masterships were not introduced until 1922.)

[3] Postgraduate Research ... (1916-17) 28 December 1916.

[4] Ibid. 4 and 11 January 1917.

[5] Ibid. 18 January 1917. This letter was written only a few weeks before Oxford decided to do just this.

Professor of Archeology — a post which Gardner himself had held before moving to Oxford — made the following reply: 'I cannot of course speak for Oxford, but if the degree of Artium Doctor were instituted at Cambridge for such a lower grade Doctorate I suspect that the profane would soon render its intitials (A.D.) as "American Doctor". This once done, it would offer but little attraction for those for whom it had been specially established.'[1]

Nevertheless, Cambridge must have been feeling vulnerable to the increasing-pressures from all sides. Thus at its meeting of 4 December 1916, when support for the introduction of research masterships was reaching a decisive peak, the Council of the Senate had had before it Lord Newton's letter from the Foreign Office pointing out the desirability of a two-year doctorate for American graduates.[2] And, at the same meeting, Oxford vice-chancellor Strong's letter of invitation to the Conference of English Universities was received. While a delegate was appointed to attend that conference, Cambridge clearly felt slighted by her sister university not having consulted her individually, prior to sending out such a general letter of invitation.

So far as the communication from the Foreign Office was concerned, this will not have come as a complete surprise to some members of the university. In mid-November, Giles of Emmanuel had received an informal communication from Leonard Whibley, asking whether Cambridge might not delay her decision on research degrees to await the outcome of the current deliberations at the Foreign Office.[3] Similarly, Stephen Gaselee, another Cambridge man at the Foreign Office, had spoken to his friend A.C. Benson, master of Magdalen, about these questions, back in June of that year. But Newton's was the first official approach to be made.

During the Spring of 1917, Cambridge, along with other United Kingdom universities received the correspondence from Alex Hill, Secretary of the Bureau of the Universities of the British Empire, regarding the need for inter-university consultation on facilities for postgraduate studies. But her representative on the Bureau, R.F. Scott, does not appear to have been a forceful participant in university politics, either at Cambridge or at the London meetings, which may have accentuated her relative isolation from the general currents in British universities at that time.

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[1] Ibid. 25 January 1917.

[2] See above, p. 121.

[3] Leonard Whibley to Peter Giles, Master of Emmanuel College Cambridge, letter dated 13 November 1916 (FO 395/11 Public Record Office). Leonard Whibley had participated in the Foreign Office discussions on American students and postgraduate facilities in Britain. He was a Cambridge man and later sat on the Cambridge 'Collaboration Syndicate' (See below, pp. 145-7).

However, other communications reached the Council of the Senate,[1] whose cumulative effect finally broke down her defences: the Bishop of Worcester urged that steps be taken 'to make it easier for Canadians and Americans to take advantage of the University course without being forced to begin from the bottom'. Dr Foakes Jackson, a Cambridge man now teaching in the United States, asked that American graduates with some previous postgraduate studies to their credit should be given the opportunity of studying for a PhD in Cambridge.[2]

Simultaneously with all other British universities, Cambridge also received a letter from Robert Falconer, chairman of the third Canadian Universities Conference held at Toronto in May 1916, reporting that this had 'unanimously resolved that in order to strengthen the unity of the Empire, the Universities of Great Britain should be urged to modify and enlarge their graduate facilities to meet the needs of students from the Universities of this Dominion.' Falconer also reiterated at great length what so many Canadians had pointed out before him, that only the introduction of doctorates obtainable within a reasonable period of time might divert the stream of Canadian students from the United States to Britain.[3]

And there can be little doubt that, while Cambridge had rejected pleas to accommodate 'commercially' motivated graduates from the United States who craved to append a particular set of initials to their names, this patriotic appeal from within the Empire was likely to meet with a more sympathetic response.

At this point too, Cambridge representatives attending the United Kingdom Conference of Universities of May 1917 learnt that not only Oxford, but most other British universities were moving towards the introduction of the PhD. At last it became clear to the Council of the Senate that the General Board of Studies, or an important section of its members, had been too obstinately conservative in these matters and to circumvent their delaying tactics, the Council resolved 'that a Special

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[1] A précis of these, dated 25 April 1917, came before the relevant university bodies later that year (précis of letters relating to foreign and colonial students, Guard Book 116*, Research Students, 175*, Cambridge University Archives).

[2] Later, Foakes Jackson, a former fellow and lecturer of Jesus College, was to make a more public complaint, when he wrote to the *Times Educational Supplement*, accusing Cambridge of a continuing blindness to the urgent need to prepare for an 'educational entente' with the States and Canada after the war, and chiding her for her lack of foresight in refusing to institute a PhD degree (Foakes Jackson 1918).

[3] Letter from Robert Falconer, dated 12 March 1917. A full copy of this exists in the Archives of the University of London, as an Appendix to the Minutes of a meeting of the Senate held 23 January 1918.

Syndicate be nominated to consider the means of promoting educational collaboration with the Universities of the Empire and foreign Universities.'[1]

The General Board of Studies' objections to this encroachment on their functions was overruled, but the Council of the Senate invited the Board to nominate four of its members to sit on the 'Collaboration Syndicate'.[2] Hobson and Ridgeway, in a final attempt to wreck the scheme, proposed that they decline to do so, but such an act of non-co-operation went too far for the majority of the Board and was rejected by eleven to three, with five abstentions.[3]

In June 1918, the Syndicate published a detailed interim report: extensive inquiries had been made in the States and Canada to ascertain the requirements of students from those countries. There had been an interview with the French Minister of Public Instruction who had spoken of a plan to introduce a two-year doctorate for foreigners and it was understood that Italy was considering something similar. Moreover, the report cited the recommendations of the two Conferences of the Universities of the United Kingdom favouring a new doctorate.[4]

The Syndicate then proposed the introduction of the PhD in Cambridge, for research work carried out over a period of three years — reduced to two if the candidate had previously been engaged in research. Awarded on the basis of a satisfactory dissertation, it was to be accompanied by written or oral tests at the discretion of the examiners. A Special Board of Graduate Studies was to be set up as the permanent body responsible for the organization of the whole scheme.[4]

When the Syndicate's draft report had come before the Board of General Studies in May of 1918, there was still considerable opposition, but in the end it resolved — with ten in favour, six against and three abstentions — 'that the proposal to grant the degree of PhD for postgraduate study be approved.'[5]

Prior to the Senate's vote on the Syndicate's report — and in effect on the PhD — Ridgeway and Hobson, who had led the opposition on the General Board of Studies, together with ten other intending non placet voters, circulated a document which once again deprecated the 'foreign' nature of the proposed degree: 'No case has been made out for the establishment of a second rate Doctorate on the ground that it is required in the interests of our British students. ... We venture to think that the University of Cambridge is in a sufficiently strong position to be able to retain its own principles, standards, and nomenclature, and supposed political exigencies and undue eagerness to attract students from over the seas, are not sufficient grounds for changing them.'[1]

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[1] At its meeting of 15 October 1917 (Minutes of the Council of the Senate, Volume 1914-17, Cambridge University Archives).

[2] At its meeting of 29 October 1917 (Ibid.).

[3] At its meeting of 7 November 1917 (Minute Book of the General Board of Studies, October 1915 — July 1923, Cambridge University Archives).

[4] Cambridge, University of (1918).

[5] At its meeting of 29 May 1918 (Minutes of the General Board of Studies, October 1915 — July 1923, University of Cambridge Archives).

The very next day, the economic historian C.R. Fay, then a young lecturer and fellow of Christ's, issued an indignant reply, describing the statement as 'regrettable in tone, argument and intellectual outlook'.[2] This was soon followed up by four members of the Collaboration Syndicate, P. Giles, J.N. Keynes, A. Hutchinson and Leonard Whibley, whose fly sheet entitled 'The PhD. Degree' ended with the telling remark that 'We believe that all other Universities in England and Scotland are proposing to offer a degree of similar character. The Senate, if it refuses to institute such a degree, will make it known that it has no desire to encourage the advent of students from our Dominions or from other countries.'[3]

In the event, on 22 February 1919, the Senate approved the proposals for the PhD by eighty-four votes to twenty-six (at Oxford and vote had been eighty-nine to nineteen), and so — just two years later — Cambridge had followed Oxford in her final acceptance of the inevitable — the PhD.

The Foreign Office returns to the scene — A.J. Balfour speaks for the PhD and university co-operation

Meanwhile, on 4 January 1918, the Secretary of the Bureau of the Universities of the British Empire had written to the vice-chancellors and principals of all the United Kingdom universities, inquiring about their universities' reactions to the resolutions passed at their conference of the year before; he wished to inform the president of the Board of Education of the measures that they were likely to take.[4] Dr Fisher would probably think it desirable for the universities to meet again in conference, as he was 'strongly in favour ... of the combination of the universities for the purpose of securing uniformity of policy, so far as this can be attained without any weakening of their independence.'[5]

Soon after this, Hill was to invite the various United Kingdom universities to choose representatives to attend an adjourned sitting of the conference of the previous May to be held in London on 10 May 1918 and, as at the previous meeting of the conference, he suggested that since it was to be a purely consultative meeting, there was no need to send a specific number of representatives.[1]

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[1] Fly Sheet headed PhD Degree, dated 17 February 1919 (Guard Book 62.2 E University of Cambridge Archives).

[2] Fly Sheet headed PhD Degree, dated 18 February 1919 (Ibid.).

[3] Fly Sheet headed PhD Degree, dated 21 February 1919 (Ibid.).

[4] A synopsis of the replied to this inquiry was later circulated to all the universities concerned. See below, p. 154.

[5] Alex Hill to Vice-Chancellors and Principals of United Kingdom Universities and University Colleges, letter dated 4 January 1918 (File marked PhD in University of Leeds Archives).

As preparations for this adjourned meeting proceeded, another event took place which was to have considerable bearing on it. Although the Foreign Office had passed over to the Board of Education early in 1917 the matter of facilities for postgraduate students in Britain, it continued for a number of reasons to be involved. Intellectual and scientific co-operation were, after all, of considerable importance to the war effort and so was the whole matter of propaganda in allied and neutral countries out of which the issue of improved facilities for advanced study and research degrees had arisen in the first place.

With America's entry into the war in April 1917, the immediate problem of how to counteract the German ideological onslaught may have been solved, but the basic issues stood out even more clearly than before. For now American migrant students would be channelled directly into the allied universities. Moreover, even after the end of hostilities with the country that had provided the academic shrines of so many of America's leading citizens, it was inconceivable that their sons should wish to follow in their father's footsteps there for many years to come.

Along with other friendly European nations and Japan, Britain sent a mission to the States to inform the new ally of her needs in the war effort and to enlist the greatest possible degree of help. The British Mission, headed by Foreign Secretary Balfour, discussed such matters as shipping, food supplies and the financing of the military effort. It remained in America for more than two months and some of Balfour's American university friends and acquaintances, as well as British university men in America, used this opportunity to draw his attention to the problem of American migrant graduates and to ask what Britain would do for them in the future.

Balfour's commitment to the furtherance of postgraduate studies for British students was thus reinforced by a more direct understanding of the urgent need to provide attractive postgraduate courses and a doctorate for Americans. At the same time, he noted that most Americans were ignorant of the facilities that did exist in Britain.

On return to England, therefore, he consulted the president of the Board of Education on how the links between British and American universities might be strengthened. Gilbert Murray, of the Universities Branch, suggested a further inter-university conference on the question and this proposal was well received. But neither the Board of Education nor the Foreign Office envisaged another ad hoc discussion. This time they were determined to ensure that the conference would result in the setting up of machinery for future co-operation and co-ordination among British universities. They wanted to see established a body to which they could refer inquiries from abroad — a body whom the government itself could consult when they wished to sound university opinion.

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[1] Alex Hill to Vice-Chancellors and Principals of Universities and University Colleges of the United Kingdom, letter dated 22 February 1918. A copy exists in the Minutes of the Council of the Senate of the University of Cambridge, relating to its meeting of 26 February 1918 (Volume 1918-21, University of Cambridge Archives).

The Foreign Secretary was, however, somewhat pre-occupied and it was not until his office received a request from the United States for a delegation of British university men to visit American universities, that he was reminded of the urgency of the matter. It was therefore only in March of the following year that Fisher was able to inform Murray that 'A.J.B. has at last issued his summons to the Universities'[1] And this is how it ran:[2]

'Foreign Office, S.W.1.
14th March, 1918.

Dear Sir,

During my recent visit to America I was more than once consulted about the possibility of establishing closer connections between the American Universities and our own, both by the interchange of students and teachers, by the exchange of information as to curricula, fees, terms and subjects of study, and by other methods. I have little doubt that there exists in the United States a real desire for greater intellectual intercourse with Great Britain, especially in the higher branches of University work where hitherto the influence of Germany has been unduly predominant.

'At the same time there appeared to be, rightly or wrongly, an impression that there exists among British Universities, as compared with German or French, a degree of local independence and variety, combined with a lack of any common organisation or even meeting ground for consultation, which made it very difficult for Americans who might desire to finish their studies abroad to find out what work was being done in Great Britain and what University could best provide for their needs.

'Of course I do not pretend to judge of the soundness of these criticisms or of the answers that may be made to them but they are reinforced by many proposals and enquiries which have come to me at the Foreign Office from France, Russia and other Allied Countries.

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[1] Herbert Fisher to Gilbert Murray, (copy of) letter dated 8 March 1918 (Herbert Fisher Papers, Dept. of Western Manuscripts, Bodleian Library, Oxford).

[2] A.J. Balfour to the Heads of the Universities of the United Kingdom, letter dated 14 March 1918. To be found in the Archives of the Universities of London and of Oxford. A draft of this is also reproduced in Ashby (1963) pp. 19-20.

'The whole matter appears to me to be of such importance that, after consulting with my friend the President of the Board of Education, and hearing from him that the Board is already interested in the matter and that the English Universities are actively considering it, I am venturing now to invite representatives of all the Universities of Great Britain and Ireland to meet Mr Fisher and myself at the Foreign Office ... and confer upon the whole subject.

'For example, the representatives might be willing, either directly or by means of a Committee, to consider the possibility —

1) Of improvements in the means of collecting and disseminating the sort of information about the several Universities which is needed by a foreigner wishing to study in Great Britain;

2) Of facilitating interchange of students and teachers;

3) Of establishing between the Universities themselves some permanent organ of communication and consultation, and, if need be, even of common action in matters of common University interest, which could enter into relations with similar bodies which already exist in some of the Allied Countries.

'I need hardly say that both Mr Fisher and myself regard the independence and complete freedom of the Universities as a matter of the very highest importance, and should not think of proposing for your consideration any step that pointed, however remotely, towards State control.

'I trust it may suit your convenience to be present and to bring with you another representative of your university.

Yours faithfully,
Arthur James Balfour'

And so it came about that the heads of British universities arrived in London on 9 May 1918 to attend the conference called by Balfour at the Foreign Office, to be followed the next day by the adjourned Conference of Universities of the United Kingdom called by the Bureau. And naturally, the first was to have a considerable effect on the second!

While an abbreviated report of the conference at the Foreign Office was included in the Bureau Committee's Report to the Congress of the Universities of the British Empire in 1921,[1] there is no evidence of a full report ever having been published or even circulated to the participants. However, recently released files of the Foreign Office include a verbatim report transcribed from the notes of what appears to have been a private shorthand writer contracting her services to the Foreign Office.[1] From this we learn that the Foreign Secretary, A.J. Balfour, was in the chair and that, among others, he was supported by the Marquess of Crewe, H.A.L. Fisher, Gilbert Murray, Sir William McCormick, as well as Stephen Gaselee from the Foreign Office and L.E. Twentyman and N.D. Bosworth Smith from the Board of Education. The eighteen universities of the United Kingdom each had two representatives at the meeting and Dr Alex Hill, Secretary of the Bureau, also attended.

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[1] Hill, A. (1921) pp. 441-443.

In opening the conference, Balfour thanked the assembled company warmly for responding to his invitation: 'I really owe an apology and an explanation for having presumed to ask for your presence. You represent all the Universities of the United Kingdom, and Universities have always in my opinion been most frightfully jealous of any sort of Departmental or Governmental interference and, certainly, if there is a Department which prima facie has no right whatever to interfere in University affairs it is the Foreign Office. Therefore I think I ought to make some sort of brief explanation of how it comes about that I have taken upon myself the responsibility of asking for your presence here to-day. The subject of our meeting really comes into the sphere of foreign affairs, because what I want to ask you to carry out is some method by which we can draw more closely the higher educational intellectual bonds which unite us to our allies and more particularly to America, to France and to Italy. This problem was brought to my notice in a very insistent and emphatic manner when I was in the United States about a year ago. I was then approached from many academic and other quarters and asked whether I could not do something to enable the British Universities — the Universities of the United Kingdom — to take some share of the work, the post-graduate work for travelling American students, which had hitherto been taken by Germany. ...

'In these circumstances I was asked and, as I say, an appeal was made to me to see what I could do to fill the gap that is inevitably made by the exclusion — the more or less complete exclusion — of Germany from the place which she had hitherto occupied. Of course I said I would do what I could. I said so not merely — I was going to say not chiefly, but certainly not merely — as Foreign Minister for the time being, but I said so also because I am profoundly interested in things academic and also, if I may express my full thoughts, because I think that post-graduate teaching has been perhaps the side of the intellectual activities of our Universities in which they have fallen somewhat behind the Universities of other countries. (Here assenting calls of hear hear came from the hall and Mr Balfour continued) Now that explains, I hope adequately, why I have presumed to take the initiative in this matter.'

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[1] Report of the Proceedings at a Conference of Representatives of the Universities of the United Kingdom, held at the Foreign Office, Thursday, 9th May, 1918. This is a 40-page typewritten document on Foreign Office file FO 395/220, Public Record Office.

Going on then to speak of the extraordinary variety of history and character of British university institutions which he believed to be immensely desirable and quite unique in the world, he pointed out that this, however, made common action among them not always very easy. It was a difficulty which would have to be surmounted and he hoped the meeting might result in the establishment of some machinery 'by which this great body of University Institutions and centres of University life can speak, as it were, on certain occasions with a common voice, and can receive from foreign countries communications intended for the whole body of academic workers in this country.'

Shortly after his address the Foreign Secretary regretfully withdrew from the meeting to attend to some urgent business at the House. Dr Fisher took over the chair and the remainder of the afternoon was taken up largely by speeches from the floor, amongst the more notable of which was that of Sir Donald MacAlister representing Glasgow. As chairman of the Bureau he was at pains to point out that this body was already fulfilling some of the functions proposed by Mr Balfour, in particular the production of the Year Book which provided much useful information. The nucleus of the machinery for a central body thus already existed. MacAlister also expressed a certain impatience regarding some of the other points raised. He pointed out what must have been known to all the representatives present, that the universities through the Bureau 'Had been considering, before the Foreign Office discovered the necessity of considering them, very many of the questions which have been dealt with today. We met last year, we formulated a number of questions, these have been submitted to the Universities, and we have now the answers of most of them, and at the adjourned meeting tomorrow we are to go into the details.'

Sir Oliver Lodge of Birmingham commented that whilst co-operation was certainly needed, there was one thing that was needed even more if a great influx of overseas students were to be attracted to this country, and that was distinguished men to teach. This required more adequate supporting staff, equipment and facilities which, in turn, required increased financial resources. And here Lodge, champion advocate of state aid to universities, was clearly not going to lose a remarkable opportunity in the presence of government officials, to direct the discussion towards the subject of finance.

Dr Fisher once again lamented on the problems he faced when trying to satisfy inquiries regarding facilities in Britain for graduate students of allied nations. He would be much relieved if there were some central university body to whom these could be referred. Moreover — and here Fisher proceeded with utmost tact — such a body could also help to avoid more than the obviously beneficial considerable degree of overlapping between universities in the same fields of specialization. This would help to ensure that what grants the state might make would be put to the most economical and effective use. Finally — and here it is interesting to remember that he was previously vice-chancellor of Sheffield[1] — Fisher also pointed out how much the beneficial migration of postgraduate students between different United Kingdom universities could be eased, if there were some central university body to facilitate it.

Fisher, who had been much involved with the committee stage of his Education Bill even on that very morning, showed no signs of begrudging time to university matters and in his diary had the grace to describe Balfour's speech as 'charming' and Hadow's as 'excellent'[2]. The same source shows that he had also prepared himself well before the meeting, when an entry a few weeks earlier noted that he had 'Read papers on advanced courses'.

Fisher, like Balfour, will have found the resolutions passed at the conclusion of the Foreign Office conference encouraging:

> 'That this Conference of the Universities of the United Kingdom recognises the importance of facilitating and actively developing intellectual intercourse between the various nations now allied against Germany, and cordially welcomes the steps that have been and are being taken to make attendance at the Universities more attractive to students from the United States, France, Italy and the other Allied countries.
>
> 'That this Conference considers it desirable in the interests of the Universities and of the nation that steps should be taken for promoting greater co-ordination and power of mutual consultation among the Universities of the United Kingdom, whether by forming Standing Committees of the Universities or by developing or expanding the powers of the Bureau of Universities of the Empire or otherwise, and commends this question to the consideration of the Conference which is to meet tomorrow.'

A third resolution welcomed the invitation for a British universities delegation to visit America.

The resumed United Kingdom Universities Conference of May 1918 confirms the PhD and sets up the Committee of Vice-Chancellors and Principals

The following day, a large gathering of university representatives met to continue their discussions of the previous May, which had resulted in the historic resolution recommending the introduction of the PhD.

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[1] For Sheffield's attitude to inter-university migration and the PhD, see above, p. 132.

[2] H.A.L. Fisher, Diary (Herbert Fisher Papers, Dept. of Western Manuscripts, Bodleian Library, Oxford).

Prior to this resumed conference, Hill had sent out an information document entitled 'Extracts from Reports from Universities regarding action taken to encourage immigration of students from foreign countries and from the King's Dominions overseas.' In fact almost the whole of its six closely typed pages were devoted to an account of the 'Degrees and Diplomas intended to encourage immigration' which were now available in fifteen universities. In a covering letter[1] Hill explained that his summary was necessarily incomplete, since certain universities were waiting to ascertain the course that others were taking before finalizing their own decisions.

The five Northern universities were in the process of introducing the PhD. Oxford already had it on its Statute Book. Edinburgh's Senate had approved its institution and so had Belfast. Glasgow and Cambridge were as yet against the PhD. Wales and Durham were generally in favour of a new doctorate but undecided on the title. Bristol's Senate regarded the creation of a special degree of PhD indicating a somewhat lower standard of attainment than her existing doctorate of science 'with great reluctance', but at the same time recognized that if other universities did so, she would 'have to follow their example.'

Overall then, an increasing number of universities — almost half, according to Hill's document — were going ahead with a PhD but, prior to the conference, the position was by no means clear-cut.

Unfortunately no minutes — formal or informal — of this reconvened conference have come to light, but an entry in his personal diary by Henry Miers of Manchester gives some indication of the feeling at the meeting:

> 'May 9th. With Rutherford to Foreign Office to confer with Balfour on the question of the proposed new PhD degrees.
>
> 'May 10th. British Universities Conference on the proposed PhD research degrees for foreign students. Rutherford made a most convincing speech and carried the whole meeting with him, though there had been a strong feeling of opposition.'[2]

From a short report in *Nature* of Rutherford's contribution to the conference, it would appear that he regarded the introduction of the PhD as of very great importance and that he was certainly whole-heartedly behind the idea. 'It should be made clear,' he said, 'that the new degree which many universities propose is an entire innovation. It will involve a full period of postgraduate training, introducing into Britain a system practically identical with that which obtains in America, and to a large extent in Canada also. It is of great importance that it should be adopted by the English-speaking world. In Britain it is likely to be a degree of very high standard, because we have the opportunity of building it on an honours basis. ... We must also consider those who come to us from a distance, who will already in many cases have done a certain amount of research. It will be a real and very great departure in English education — the greatest revolution, in my opinion, of modern times.'[1]

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[1] Alex Hill to the Vice-Chancellors and Principals of the Universities of the United Kingdom. A copy exists in Conference I, Vice-Chancellor's Archives, University of Manchester.

[2] Diary of H.A.Miers, in an unpublished autobiographical sketch to which access was kindly granted by his nieces, Miss J. Fry and Miss S. Fry of Oxford.

The writer of this report described Rutherford's remarks as 'an epitome of the views of the Conference', but Miers's more careful and dialectical judgement of Rutherford's powerful influence on the somewhat cautious university men present, gives a more accurate idea of its real significance.

The conference reaffirmed the resolutions adopted at the meeting of May 1917, and commended them to the universities as a basis for common action. Furthermore — and no doubt arising out of the meeting at the Foreign Office the day before — it was unanimously agreed: 'That this Conference considers it desirable, in the interest of the Universities and of the nation, that steps should be taken to promote co-operation and mutual consultation among the Universities of Great Britain and Ireland.' It was further resolved nem. con. 'That the Vice-Chancellor or Principal of each University, or a deputy appointed by him, together with the Executive Committee of the Universities Bureau, be appointed a Standing Committee to consider any matters of common interest arising out of the proceedings of this Conference or submitted to it by the Government, and to report from time to time to the Conference.'[2]

And so began the Committee of Vice-Chancellors and Principals which was to hold its first meeting later that year.[3]

The effect of the conference on those institutions that had been undecided or opposed to the PhD degree was clearly considerable. Faced by a formidable array of institutions already proceeding with its introduction, they began to feel the threat of being left behind. The tide had turned and was sweeping them forward in its gathering momentum.

Cambridge was already beginning to have serious second thoughts at this time and Bristol, Durham and others, having waited to see what the rest would do, soon complied. Glasgow put up a somewhat fiercer battle, but in the end also accepted the inevitable.

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[1] Conference of Universities (1918).

[2] Hill, A. (1921) p. 439.

[3] 22 November 1918.

London is the last to hold out against the PhD

There then remained just one in isolation — the University of London. This great institution, which had for so long been the subject of controversy among university reformers and which many had considered to have the makings of a great postgraduate school, in fact turned out to be the last bastion to hold out against the PhD.

One of the major problems raised at other universities when considering the lower doctorate was the effect it would have on the already existing higher doctorates. Would it eclipse the latter? Would they continue to attract any candidates if the coveted title of doctor was made available after a much shorter period of study?

The effect of the PhD on the lower degrees of Master did not become an issue. At Oxford and Cambridge these were in any case still automatic. In Scotland the MA was the title of the first degree. Elsewhere they might require a one-year course but often only a minimal research element. The Northern universities had only recently begun to emerge from the old Victoria University custom of awarding them automatically.[1] But there was one university that had never awarded an 'automatic' Masters degree and that was the University of London. Moreover, although its MA still included a strong examination element, it had only recently, in 1914, introduced an MSc which, except in mathematics, was wholly a research degree, requiring a minimum of one year's study from London graduates and two years from students of other universities.[2]

And so her very modernity in instituting research masterships long before most other universities, led to London's reluctance now to introduce this new lower doctorate, which so closely resembled her already existing masterships.

London's Imperial Studies Committee and her Academic Council had been discussing the question of the PhD for quite some time, before it came to the notice of Senate. When the latter first considered the matter, on 23 January 1918, it therefore had before it an accumulated mass of documents, most of which the other universities had already dealt with long before. There was, for example, the letter from the president of the American Association of University Professors of October 1916 and the one from the president of the University of Toronto on behalf of the Canadian universities. There was also the report of the Conference of the Universities of the United Kingdom of May 1917 and that of the resolutions passed by the Northern universities. Furthermore, the chairman of the Academic Council had produced a memorandum on the steps being taken by other British universities.

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[1] Bachelors of that university with a good Honours degree could obtain the MA without any further examination or dissertation. This practice continued in Leeds until 1907 and Manchester until 1915. In Sheffield where even the MSc was automatic for some students, it only ceased in the mid-thirties.

[2] See above, pp. 91-92.

Of greatest immediate consequence, however, was a long report prepared by the Imperial Studies Committee in which it declared itself against the introduction of the PhD, mainly on the grounds that London already possessed a perfectly good research degree. The suggested requirement for the PhD of 'not less than two years of whole-time work devoted to advanced study and research' was in fact exactly what was currently required for the mastership in practically all faculties in the University of London. And that degree was highly valued and increasingly popular.

The Committee conceded 'that among some overseas students there is a demand for the title of Doctor on the easiest possible terms in order to enable them to compete on their return home against those who have worked in American, Belgian, Dutch and German universities and have taken PhD degrees of those universities. The best students whether from America or the Colonies care little for English degrees, but they care a good deal for opportunities of work under English scholars of international reputation and having done the work they in the majority of cases, embody their results in a thesis for presentation to their own universities. ... We shall attract such students to London less by the establishment of new degrees than by the building up of a proper apparatus of seminars, etc., which will systematise methods of research and really afford help for original workers.'[1]

In general terms the Academic Council underwrote the Imperial Studies Committee report, pointing out that a lower doctorate would also 'affect prejudicially the existing doctorates and so injure the University.'[2] The Senate concurred and resolved to inform all the universities of the United Kingdom of the reasons that led to her decision not to introduce the PhD degree.[3] It would appear, however, that by this time her negative attitude had little effect on those universities which had not yet introduced the new degree, as they had largely been convinced by the arguments from the other side.

In May 1918 the journal *Nature* published a derogatory article on London's opposition to the new doctorate.[4] Because of what he regarded as the dubious and variable standard of London's existing doctorates, the writer felt that any new lower doctorate was unlikely to disturb the equilibrium, since really there was none to disturb! Moreover, by prevaricating, London was missing a great opportunity for the development of her university.

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[1] Report of the Imperial Studies Committee entitled Post-graduate Work and Degrees in the University of London..., dated 29 November 1917 (University of London, Minutes of the Senate, 23 January 1918. University of London Archives).

[2] Report of the Academic Council to the Senate, dated 7 January, 1918, for Senate's consideration at its meeting of 23 January 1918 (Ibid.)

[3] At its meeting of 23 January 1918.

[4] Signed W.A.T. See Tilden (1918b).

To this, one of London's strongest opponents to the PhD, M.J.M. Hill, retorted that she was indeed providing plenty of opportunity for postgraduate studies, she merely felt that her existing doctorate would be endangered by the introduction of the PhD and this was in accord with the decision of the 1917 Universities Conference to the effect that standards of existing doctorates should be maintained.[1]

In the autumn of that year Hill was still remonstrating that London University was responding to the call from the overseas universities for a doctoral degree: she had such a degree and indeed a perfectly good one. An article along these lines appeared in the *Times Educational Supplement* of 3 October 1918, and on that same date he complained to the vice-chancellor of Cambridge about the one-sided manner in which Cambridge had recently publicized a critical report on London.[2]

Meanwhile, however, London's Imperial Studies Committee had undergone a change of attitude, as evidenced by their Report of 25 June 1918, which began with this face-saving paragraph: 'In the discussion that resulted in the Report of the Imperial Studies Committee of 29th November 1917, it was stated, amid general approval, that the decision then come to, deprecating the establishment of a new doctoral degree of lower standard than the existing doctorates in the University of London, might have to be reconsidered should new circumstances arise.[3] Such new circumstances have now arisen, and it appears to be necessary that the Committee should again take the matter into consideration.'

It then listed the 'new circumstances', which were that the Conference of Universities of the United Kingdom of 10 May 1918 had confirmed the resolutions of the year before and that 'During the course of the discussion it appeared that the University of London was the only University actively dissenting from the establishment of a new doctoral degree of a lower standard than the existing doctorates. ...

'Opportunities have recently arisen for detailed discussion with men of high academic position in the United States of America, some of whom have been charged by the American Universities with the special duty of exploring the post-graduate possibilities in British Universities. Each of these gentlemen deprecated very strongly the decision of the University of London to take up a dissenting position ... in regard to the question of the establishment of a new doctoral degree. They do this on the ground that the degree of PhD has a considerable value in the United States and Canada. In many subjects they would prefer their students to undertake their researches in the unrivalled materials that exist in London rather than proceed to either a French or a provincial University, but they are distinctly of opinion that any student doing this will, to a certain extent, handicap himself because he will not on his return possess the universally recognised degree indicating that he has been trained in research methods. ...

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[1] Hill, M.J.M. (1918).

[2] Hill refers here to a short paragraph in a Report printed in the *Cambridge University Reporter* of 26 July 1918 (see Cambridge, University of (1918) p. 280).

[3] That report itself, in fact, gave no indication whatsoever that such a proviso had been made during the discussion preceding the decision to oppose the PhD.

'Many persons of academic position in the Colonies regret the decision of the University of London to stand aside in this matter as making a breach in the unity of our British Universities. ...'

The Committee then proposed the institution of the degree of PhD in the University of London, by a vote of six to two.[1]

The Academic Council, having considered the report at its meeting of 8 July 1918, passed it on to the faculties for comment, supplying them at the same time with a list of all the British universities that had already instituted, or were proposing to institute the PhD.

And finally, on 28 May 1919, the Senate of London University resolved in favour of the introduction of the PhD for internal students in the faculties of theology, arts, science and economics. Candidates were to have completed not less than two full years' full-time study or its equivalent in evening work and the degree was to be an avenue to the higher doctorate. A proviso was added that no alterations be made to the regulations for the MA and MSc degrees.

The engineering faculty which disagreed with the decision did not award its first PhD until 1923. The Council for External Studies had also objected though, as might be expected, the clamour from its students was considerable, and by the time the External Council finally agreed to introduce it — towards the end of 1920 — a queue of candidates was waiting before even a draft entry form had been considered, and a year later theses were piling up even before instructions had been issued to examiners.

And so, finally, the PhD had arrived in all British Universities: symbol of the modern era of organized training in research — conceived and nurtured in Germany, imported and commercialized by America and finally introduced into Britain in order to wean the latter's students away from the former's universities.

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[1] A Reconsideration of the Question of the Establishment of the PhD Degree in the University of London, dated 25 June 1918, Report of the Imperial Studies Committee, appended to the Minutes of the Academic Council meeting of 8 July 1918 (University of London Archives).

POSTSCRIPT

A full assessment of the extent to which the hopes and fears accompanying the introduction of the PhD have been fulfilled or justified would require another work of equal length. A very brief resumé of its early years and a statistical overview of subsequent developments suffice, however, to show that the impact of the PhD went far beyond anything visualized by most of its early pioneers.

Early years

It 'took off' immediately. Within five years, 774 PhDs had been awarded and this figure was to double during its second quinquennium (see Table I, p. 164). An indication of the immediate importance attached to the new degree and the problems associated with its introduction are the numerous sessions devoted to related topics at university conferences of the 1920s and 30s. Quinquennial Congresses of the Universities of the British Empire included discussions on 'Training in Research' (1921), 'The Actual Working of the PhD Scheme' (1926), 'The Standard and the Conditions of Candidature for the PhD in relation to other Post-graduate Qualifications.' (1931), and 'Provision in Great Britain, for Post-graduate Studies for British and Overseas Students' (1936). Similarly, in 1922, the annual Conference of Home Universities devoted a session to 'The Urgent Need for the Provision of Enlarged Opportunities for Advanced Study and Research in British Universities' and two years later it discussed 'The PhD Degree as an Encouragement to Higher Study and Research.'

While some regretted its introduction because in their experience the problems it had created were not justified by the results, most spoke positively about the impetus the new degree was giving to the improvement of facilities for advanced study and the raising of the level of research activities generally. There were demands for increased government grants to finance these developments and also for residential provision to accommodate the rising number of graduate students from overseas.

Individual universities were debating the advisability of part-time study for the PhD, whether staff should be permitted to become candidates and how they would be supervised. The whole question of supervisors and examiners had to be sorted out. Comparative standards for the degree were a continuing problem — not only as between universities[1] but also, as had been foreseen by some of the PhD's opponents, in relation to existing higher degrees within individual universities.

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[1] See AUT (1926)

Thus one of the arguments for finally introducing the MSc and MLitt at Cambridge in 1922, was that it would enable those whose theses did not reach the required standard for the PhD at least to be awarded a Masters degree. This concept of the Masters degree as a 'sink' for failed PhDs aroused strong feelings, not only at Cambridge. On the other hand, in London a failed DSc was permitted to submit the same thesis for a PhD as early as 1921. In Edinburgh a failed DLitt candidate was accepted for a PhD in 1930.[1]

Statistical overview to 1982

The structure of higher degrees existing at the time of the introduction of the PhD has, certainly in the case of the three oldest English universities, had a considerable effect on the role of the PhD degree — even to the present day. In London, with its century-long tradition of earned Masters, the number of PhDs only rose above that of Masters for a short period during the 1950s and early 1960s. By 1970/71, twice as many Masters as PhDs were awarded (2,175 against 1,092) and five years later the proportion had risen to five Masters for every two PhDs. In Cambridge, on the other hand, where earned Masters degrees were only introduced subsequently to the PhD, the latter was always far more popular than the MLitt and MSc. Its ratio rose from two to one (32 PhDs to 16 Masters) in 1925/26, to fifteen to one (417 PhDs to 29 Masters) by 1975/76.[2] In Oxford, where the equivalent of earned Masters (the BSc and BLitt) were introduced well before the DPhil, the latter began to predominate only when it did in Great Britain as a whole (see Table II, p. 165) in the early fifties.[3] But while in most other universities the number of Masters degrees had surpassed that of PhDs once again by 1970/71, in Oxford the DPhil remained in command and in 1980/81 approximately three DPhils were still being awarded for every two Masters.

If we look at the overall position (Table II, p.165), the PhD outnumbered Masters from 1950/65, but since then the position has been reversed, partly due to the extraordinary proliferation of Masters degrees by courses of instruction.

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[1] See University of London, Minutes of the Council for External Students, 5 October 1921 (University of London Archives) and University of Edinburgh, Minutes of the Senatus Academicus, 12 June 1930 (University of Edinburgh Archives).

[2] With the introduction of the MPhil, however, this situation changed once again, and by the academic year 1979/80, when 130 MPhils were awarded at Cambridge, the ratio of PhDs to Masters was reduced from seven to three.

[3] No doubt the predominance of science in Cambridge has also been a most important contributory factor to its high proportion of PhDs compared with classics-orientated Oxford.

The number of postgraduate students at British universities has increased throughout the period of the PhD's existence, their share of the total student population having risen during the 25 years from 1925/26 to 1950/51 from 5% to 10%. Twenty-five years later again, by 1975/76, this figure had risen to 15% (showing that while the postgraduate share was still rising, the rate of its growth was now declining).[1] No doubt the vastly increased financial support for postgraduate students has been a major factor here. The development of the PhD as the sine qua non of academics in the physicial sciences and more recently in the social sciences and to some degree in arts, has also had its effect, as has the greatly increased number of overseas students.

During the first decades of the PhD the university world was astonished, not so much at the relatively small influx of American and Dominion students, but by the popularity of the new degree among British students. Overall statistics for postgraduate students from overseas are not available for the years before 1957/58 but we know, for example, that between 1920 and 1946, of 538 DPhils awarded in Oxford, 279 (just over half) went to British students, 85 to those from the USA and 113 to students from the Dominions. Similar figures for Cambridge are: 1,104 PhDs awarded, of which 757 (approximately two-thirds) went to British students, 60 to Americans and 204 to those from the Dominions.[2]

Between 1957/58 and 1970/71 the number of Commonwealth graduate students at British universities rose by 97% to 4,964, whereas foreign graduates (including those from the USA) went up by 243%, to 5,826. Overseas postgraduate students as a whole rose by 156% during that period and by another 59% in the following 5 years, so that in 1975/76 they constituted 34.5% of all postgraduate students. By 1978/79, this figure had risen to the all-time high of 37%. Now, however, with the enormous rise in fees for overseas students, a decline is setting in and in 1980/81 overseas postgraduate students constituted 34.7% of all postgraduate students in the United Kingdom.

The relatively small influx of American students to Britain over the whole of this period has been accompanied by an ever increasing number of British graduates accepting postgraduate fellowships at American universities. Many of them have remained there as academics or research workers in industry, forming a brain drain of considerable dimensions. American recognition of the political significance of attracting overseas students to her universities has not diminished since the Boxer Rebellion scheme. The Commonwealth, Rockefeller and Fullbright scholarships and fellowships bear witness to that, and especially the last of these which has taken many thousands of British graduate students to the States, financed by the sales of surplus US war materials to Britain!

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[1] In 1977/78, both the absolute number of postgraduate students, and their share of the total number of students, was declining for the first time and the latest figures, for 1980/81, show that this trend is continuing.

[2] Aydelotte (1946) p. 61.

The degree to which industry has benefited from the postgraduate explosion is too enormous a topic to tackle here, but, taking the financing of postgraduate students by industry and government as an indicator, the PhD has clearly been accepted as an important (if imperfect) means of training research workers.

In this connection, attention must also be drawn to significant changes in the distribution of graduate students among the various faculties over the past sixty years. As will be seen (Table III, p. 166), arts students slightly exceeded pure and applied science students at the beginning, but by 1930/31 their percentage of the total had fallen even below those in pure science alone. Only with the social sciences explosion of the sixties and seventies did arts and social sciences together recover their position, though it must be noted that the latter surpassed arts from 1970 onwards.

While these figures relate to postgraduate students as a whole, among those working for the PhD, the proportion of science and technology students was always far greater. No overall figures are available for this, but in London, for example, during the first six years of the existence of the PhD, the number awarded in the faculty of science was three times that conferred on students in the arts faculty, with chemistry being by far the most popular field (in contrast to Cambridge, where physics headed the list). In Wales, during its first ten years, eighty-two PhDs were awarded in science and only six in arts.

A full analysis of the effects of the PhD and its role today goes beyond the confines of our task here but, while developments in postgraduate education have taken a course that could hardly have been foreseen in the second decade of the twentieth century, whatever may be said about it, the PhD has certainly become a British institution.

TABLE I

PhDs awarded 1920-1930

	1919-20	1920-1	1921-2	1922-3	1923-4	1924-5	1925-6	1926-7	1927-8	1928-9	1929-30
Birmingham	–	2	7	4	5	9	12	6	15	12	15
Bristol	–	2	2	3	6	4	3	8	2	6	4
Cambridge	–	3	9	22	31	43	32	25	50	45	58
Durham inc. Newcastle	–	–	1	1	6	5	5	5	7	2	2
Exeter	–	–	1	–	–	–	–	–	–	–	1
Leeds	–	1	4	4	4	6	13	16	11	8	24
Liverpool	–	3	9	24	4	27	18	14	18	11	12
London	–	9	28	46	48	51	98	86	116	109	111
Manchester	–	6	9	3	10	17	17	10	11	7	16
Nottingham	–	–	–	–	–	3	–	3	1	–	3
Oxford	2	4	10	20	17	13	11	19	19	25	21
Reading	–	–	–	–	1	1	–	3	1	1	3
Sheffield	–	3	3	3	4	1	3	12	5	11	15
Wales	–	3	–	5	6	3	7	9	11	6	13
Aberdeen	–	–	–	2	1	1	7	5	3	5	5
Edinburgh	–	10	14	17	35	30	31	28	39	40	46
Glasgow	–	2	–	7	8	20	18	13	4	19	16
Glasgow RCST	–	–	–	–	–	–	–	3	–	9	2
St Andrews	–	7	8	12	7	12	10	8	10	6	10
TOTAL GT. BRITAIN	2	55	105	173	193	246	285	273	323	322	377

Source Year Books of the Universities of the British Empire and University Calendars

TABLE II

Higher degrees awarded at British universities

	Masters[1]		PhD		Higher doctorates		TOTAL
		%		%		%	
1890-91	18	10.0	–	–	161	90.0	179
1895-96	12	5.4	–	–	209	94.6	221
1900-01	47	18.2	–	–	212	81.8	259
1905-06	57	18.8	–	–	247	81.2	304
1910-11	271	50.8	–	–	262	49.2	533
1915-16	192	58.4	–	–	137	41.6	329
1920-21	401	57.6	55	7.9	240	34.5	696
1925-26	471	48.8	285	29.5	209	21.7	965
1930-31	527	43.4	405	33.3	283	23.3	1,215
1935-36	565	42.0	532	39.5	249	18.5	1,346
1938-39	571	42.3	547	40.6	230	17.1	1,348
1945-46	334	48.0	213	30.6	149	21.4	696
1950-51	791	35.2	1,153	51.4	301	13.4	2,245
1955-56	784	29.5	1,665	62.6	210	7.9	2,659
1960-61	1,203	36.7	1,837	56.1	236	7.2	3,276
1965-66	2,671	42.8	3,297	52.9	269	4.3	6,237
1970-71	7,632	59.9	4,815	37.8	286	2.2	12,733
1975-76	10,811	64.9	5,530	33.2	315	1.9	16,656
1980-81	13,402	67.2	6,199	31.1	342	1.7	19,943

[1] Excludes MAs at Oxford, Cambridge and Scottish Universities. Includes BSc and BLitt and BPhil at Oxford.

Source Reports from Universities and Colleges (Board of Education); Year Books of the Universities of the British Empire; Year Books of the Universities of the Commonwealth; University Calendars

TABLE III

Full-time postgraduate students at British universities — according to faculty

	Arts		Social sciences		Pure science		Medicine		Engineering		Agriculture		TOTAL
		%		%		%		%		%		%	
1910-11[2]	276	51.5	(with arts or science)		155	28.9	52	9.7	53	9.9	–	–	536
1920-21[2]	594	46.6	(with arts or science)		373	29.2	161	12.6	144	11.3	4	0.3	1,276
1930-31	859	38.4	(with arts or science)		954	42.6	170	7.6	216	9.7	38	1.7	2,237
1938-39	1,175	38.0	(with arts or science)		1,268	41.0	198	6.4	388	12.5	65	2.1	3,094
1950-51	3,297	38.8	(with arts or science)		2,893	34.0	1,014	11.9	1,007	11.8	291	3.4	8,502
1960-61	3,326	22.8	1,962	13.5	5,058	34.75	1,133	7.8	2,628	18.1	448	3.1	14,555
1970-71	6,733	19.6	7,777	22.6	10,752	31.2	2,243	6.5	6,031	17.5	902	2.6	34,438
1980-81	6,711	17.3	10,300	26.5	10,828	27.9	3,560	9.2	6,352	16.3	1,081	2.8	38,832

[1] Excludes graduates studying for the one-year Diploma of Education.

[2] Excludes Oxford and Cambridge.

Source Reports from Universities and Colleges (Board of Education); University Grants Committee, Annual Returns; Statistics of Education, Department of Education and Science; Universities Statistical Record, Volume I, July 1982

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